

BULETINUL ȘTIINȚIFIC
al
Universității Politehnica Timișoara, România
Seria INGINERIE ȘI MANAGEMENT
Vol. 6, Nr. 2, 2020

SCIENTIFIC BULLETIN
of
Politehnica University of Timisoara, Romania
Transactions on ENGINEERING AND MANAGEMENT
Vol. 6, Issues 2, 2020

ISSN 2392 – 7364
ISSN-L 2392 – 7364

This new journal series is the new face of two former journals:

- *The Scientific Bulletin of Politehnica University of Timisoara, Transaction on Economics and Social Sciences (ranked according to CNCSIS classification in Romania: D class);*
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Editorial

Anca DRĂGHICI¹

The Editorial Board of the “*Scientific Bulletin of Politehnica University of Timisoara – Transaction on Engineering and Management*” (ISSN 2392-7364) kindly inform our community of contributors and readers that the journal has start a new episode confronting the publication with the pandemic period.

Based on our early achievements in 2020, we are motivated to increase the quality of the research and to encourage the publication of multidisciplinary and interdisciplinary works of a large diversity of researchers. Due to the pandemic, we have received many articles and after the review process, the editorial board has approved the publication of six representative studies.

We would like to address special thanks to the reviewers (members of the *Associated Editors*) because their careful and professional (volunteer) review work has a positive impact on the quality content of this volume. In addition, we appreciate the constant implications of the members of *the Research Center in Engineering and Management (RCEM)*² (from the Faculty of Management in Production and Transportation, Politehnica University of Timisoara, FMPT/UPT, Romania) in supporting each issue of the Scientific Bulletin publication. Furthermore, RCEM provide a productive and positive environment through which we share ideas and knowledge between young people and seniors involved in research activities (formal or informal).

The current issue presents a collection of articles reflecting actual topics and research thematic in the field of economics, quality management and educational aspects related to project management. It seems that sustainable development is the key aspects approached by all articles.

The first paper, “*A Proposed Framework for Talent Management Development*”, proposed by Dana FATOL, Diana ROBESCU, Igor RIZNAR, Anca DRĂGHICI presents an overview of the existing literature and current practices related to talent management. In this paper authors have proposed a

new general and simplified model that leverages neuroscience practices to support learning and employees’ experience for improving their skills and behaviors towards a better performance. The model and its elements will be subjects to further studies that hopefully will be published in the Scientific Bulletin.

The second paper “*A Bibliographic Study on the Use of Communication in Relation to the School Relationship - Coordinating Institutions*” has been developed by Nicoleta SLABU, Mihaela Luminita LUPU (both from „Gheorghe Asachi” Technical University of Iasi, Romania). The development of this study determined the conceptual analysis of the communication process within the school relationship - coordinating institutions and formulation of important conclusions that may constitute the theoretical foundation of future studies.

The third paper presents a study entitled: “*Business Ethics in Norway: History of Business Ethics in Norway and Guidelines of Council on Ethics for the Government Pension Fund Global*” by Darius BARMAYOUN and Marian MOCAN (from Politehnica University of Timisoara, Romania). The aim of this paper is created an overview of the business ethics as practiced in Norway. Researches draw attention to an article published in 1959, a vision of business ethics history in Norway under the rise of industrialism is described. Subsequently, the role of the Council on Ethics for the Norwegian Government Pension Fund Global (GPF) is explained and its guidelines are presented. Aiming to obtain an overview of business ethics in Norway during both industrial and modern era and understand how views have changed during the time, a comparison is conducted.

The fourth paper entitled “*Analysis of Value Creation and Value-Added Analysis Techniques in Published Literature. A Literature Review*” by Darius BARMAYOUN and Marian MOCAN (from Politehnica University of Timisoara, Romania). The aim of this paper is to review available literature in the field of value-added analysis and value creation. Value

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² Information are available at: <http://www.mpt.upt.ro/eng/research/research-center.html>

added analysis techniques and approaches which are described in the literature are to be presented and systematized. Subsequently a case study is presented and suggestions for process improvement are presented. Aiming to obtain an overview from both the theoretical and practical sides, papers and books from 2006 to 2020 were collected and classified. First according to the genre of the text, secondly, according to the industry meant to be improved, and thirdly, according to the use of single or multiple approaches of value creation.

Next article entitled: ***“The management of smart and sustainable urban projects. A view into the Caransebes public administration project challenges”*** has been proposed by Gabriela BANADUC and Nicoleta MIREA (PhD Students from Politehnica University of Timisoara, Romania). This paper aims to review the management of smart and sustainable urban projects, to generally analyze public administration and the Caransebes municipality project challenges. This is the first paper published in our journal by these authors, which totally aligned to our aim to support and encourage new researchers.

In the next article entitled: ***“STEM Education and the Water Management. An Entrepreneurship Initiative”***, the authors: Nicoleta MIREA, Constantin

Florin BOGDEA, Irina OROIAN have presented a preliminary study on STEM education. The aim of the paper is to establish the current state of a new STEM (Science – Technology – Engineering - Mathematics) learning method concerning entrepreneurship towards different ages of students by evaluating the situation of water sustainability. Based on the findings of the study, the new and the old one, we could be able to develop a motivational program taking into consideration all the key findings and suggest policies and initiatives that could empower and enhance them to keep clean water. The analysis will be fundamental to develop entrepreneurial competences taking into consideration exchange of good practices project also.

The last paper presents ***“Massive and repeated molecular testing a tool in the pandemic Covid-19 prevention management system”*** developed by a team of authors Alin GAUREANU, Anca DRAGHICI, Paula Nicoleta NEAG (al from Politehnica University of Timisoara, Romania) have proposed a debate on prevention actions during the pandemic. This study is concerned with a actual problem and has offered a global perspective of the efforts that have been done for limited the impact of the health crisis.

A Proposed Framework for Talent Management Development

Dana FATOL¹, Diana ROBESCU², Igor RIZNAR³, Anca DRAGHICI⁴

Abstract: For keeping a competitive advantage within a dynamic business environment and being ready to face a crisis when occurred, organizations should make sure they have the right competencies and behaviors in-house through a proper talent management. Considering the existing literature and current practices related to talent management, in this paper we are proposing a new general and simplified model that leverages neuroscience practices to support learning and employees' experience for improving their skills and behaviors towards a better performance. The model and its elements will be subjects to further studies.

Keywords: Talent Management, Talent Development, Employee Competencies, Neuroscience, Human Resources

I. INTRODUCTION

Organizations that take a strategic approach towards the HR development and have strong talent management (TM) programs achieve the competitive advantage within any market. The human capital, as intellectual asset of any company, needs to possess the right competencies, attitude, and have a positive mindset to support future growth and innovation (Kravariti & Johnston, 2020).

Ten years ago, Klett (2010) has published the competency-based holistic model for Human Resources Management (HRM) strategy, which is containing the main components of a web-based strategic structure that allows identifying, mapping, and planning of workforce development (Figure 1).

Using the proposed holistic competency based HRM model and associated approach, HR professionals can easily satisfy the need for specific competencies for different roles related to the organizations, allowing to track those and enable proper assignment of the people to the right jobs. The model considers two types of competencies: behavioral and technical. The behavioral ones are considered more like soft skills and can be taken in on various job

descriptions, as the technical competencies are unique for each role. Monitoring employees' life cycle or careers, as well as certifications and potential gaps of competencies are essential for further identification of the best learning and development opportunities. Learning management systems offer employees self-paced and self-organized opportunities to get the right knowledge, identifying gaps, monitoring progress and results (Klett, 2010).

Competency-based approach is now more or less generalized in modern organizations; it seems in the 1990s up to 75% of organizations already used competency-based methods (Sliter, 2015). Competencies are generally considered to be combinations of knowledge, skills, abilities, and other individual attributes that are necessary for performing job and for measuring the individual performance. From the organizational perspective, the competency-based model should be strategic, functional and flexible (Sliter, 2015).

Furthermore, defining organization's core competencies gives employees the proper understanding on what they need to be productive (in terms of knowledge, skills, abilities) and in the same time allow organization to evaluate the availability of the required resources. Linking competencies with Talent Management (TM) can become a win-win situation, allowing companies to make sure they have the best workforce in house and develop a strategic human resource management system (Wuim-Pam, 2014).

In this context, the present paper's objective is to introduce a new TM framework based on a brief and consistent literature review on TM and preliminary arguments for introducing neuroscience approach in HRM.

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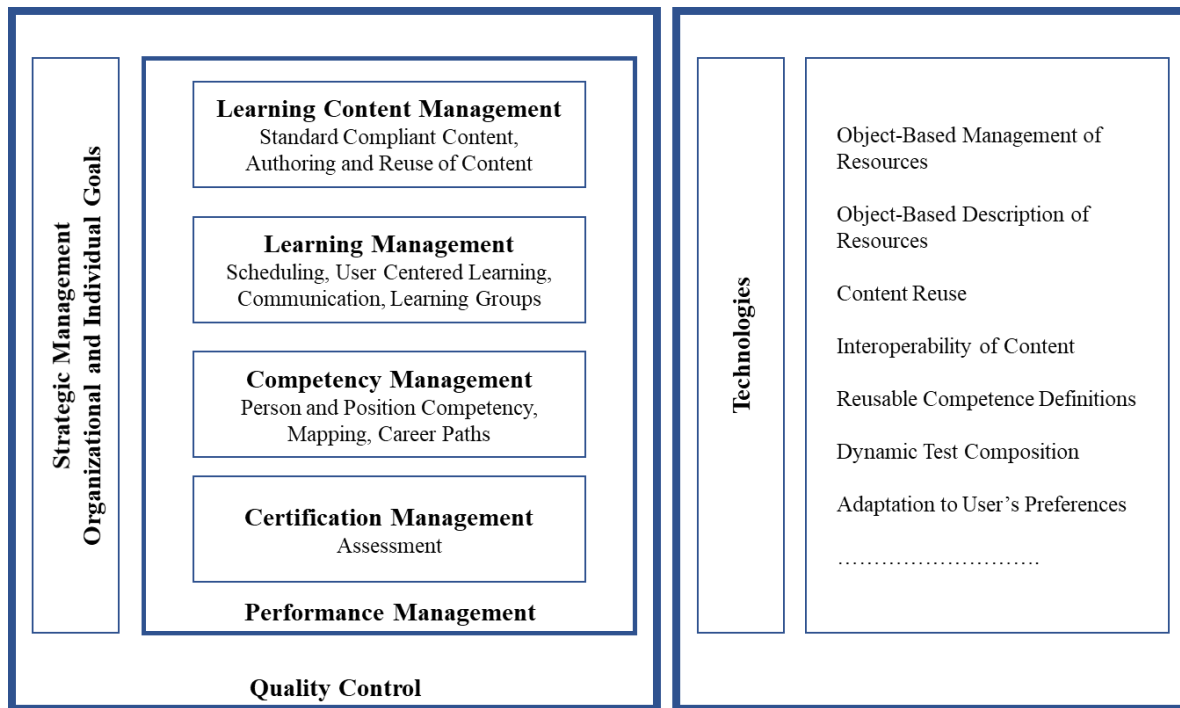


Figure 1: Main components of a holistic competency based HRM structure (Extended from (Klett, 2010))

II. LITERATURE REVIEW ON TALENT MANAGEMENT

A. A general view on talent concept and management

In industrial-organizational psychology, the talent is seen from an individual differences' perspective, covering the cognitive ability, knowledge, and personality. From the education psychology perspective, talent is seen as giftedness, the possession and use of natural abilities, mainly across four domains: intellectual, creative, socio-affective and sensi-motor. Those could be transformed into real talent in the field of academics, arts, business, leisure, social action, sports or technology. There has always been a dispute on innate vs. acquired talent, about the extent to which talent can be taught or learned. According to some views, TM requires identification and recruitment of talent, for other researchers there is a focus on learning and experience. In some cultures, such as Western European, it is believed that talent is innate, while in other, such as Asian cultures, talent is the results of many years of hard work and dedication (Dries, 2013). From the literature perspective, TM is based on theories of organizational behavior and human resource management. The key for strategic TM system is the development of a talent pool and creation of a HR architecture to maximize the potential for exploiting those talent pools (Collings & Mellahi, 2009). "The systematic identification of key positions which differentially contribute to the organization's sustainable competitive advantage, the development of a talent pool of high potential and high performing incumbents to fill these roles, and the development of a differentiated human resource architecture to facilitate filling these positions with competent

incumbents and to ensure their continued commitment to the organization" (Collings & Mellahi, 2009).

The question whether talent is predominantly an innate construct or completely acquired (or something in between) remains unanswered due to the lack of an in-depth theoretical framework or conceptual foundation. On the one hand, talent is often described as an innate ability that manifests in a particular field (Tansley, 2011), and consequently, equated with excellent performance in a given field (ranging from music to chess and from sports to visual arts). On the other hand, for some researchers, talented people are made through deliberate practice and learning (Ericsson et al., 2007; Pfeffer and Sutton, 2006; Ericsson 2006).

An exclusively pragmatic view on the matter under discussion would very likely try to avoid the distinction between innate and acquired elements of talent and argue that the nature-nurture debate is untenable, especially under the recent developments in the field of brain and mind science, genetics and evolution. Cognitive science has shown that there are complex innate mechanisms for learning as well as tool kits in the genome that help structure the brain during development, and mechanisms of plasticity that make learning possible. This calls for a new, extremely complex, nature vs. nurture debate, which will exclude the notion of innate vs acquired as two strictly unconnected alternatives.

In this context, it is easy to understand why some HRM practitioners focus on talent identification while others focus on talent development but would warn the future TM practitioners to rethink their ideas in the light of new discoveries so that their theoretical background may not appear too simplistic or even wrong. In the absence of a sound theoretical

background, TM will remain a pompous pseudo-scientific alternative for what has been known as HRM.

B. A simplified model for HR talent

The most simplified model for defining HR talent has only three essential “ingredients” (Ulrich, 2007; Ulrich, 2015):

$$HR\ Talent = Competence \times Commitment \times Contribution \quad (1)$$

Equation (1) known as The Talent Trifecta was released around 2007 and can be applicable in any business context. Competence can be reduced to “right skills, right place, right job”. When defining competencies, HR professionals will have to understand first the future customer expectations in a changing business environment and translate those into current employee requirements as soft and hard skills. However, without commitment or engagement, employees will not put enough effort and time in reaching their targets. Employees have a higher level of commitment when their organizations facilitate the sense of community, encourage good communication and work flexibility, provide opportunities and good incentives, give a sense of direction, and create an impact. Furthermore, people’s interest must be kept at higher levels, so they feel they are making a real contribution through their work, having a purpose and same time meeting their personal needs. “Competence deals with the head (being able), commitment with the hands and feet (being there), and contribution with the heart (simply being)” (Ulrich, 2007; Ulrich, 2015).

According to the literature review in the field of modeling TM of there have been centralized the following observations:

- TM is highly contextual. Both the organizational internal and external context affect the intended TM strategy, including the actors involved in TM and their interrelated logs (Collings & Mellahi, 2009; Jantan et al., 2009; Thunnissen & Buttiens, 2017);
- There is a dominant of empirical studies in TM (Gallardo & Thunnissen, 2016);
- Fuzzy logic approach could be implemented for talent management (Jantan et al., 2009; Karatop et al., 2015);
- There is a knowledge gap in mathematical modeling TM approach.

C. The key competencies of the future

The define Volatile, Uncertain, Complex, and Ambiguous (VUCA, Figure 2) environment requires HR and TM professionals to change the focus and methods of leadership development. Thus, VUCA environment has been recognized since late 1990s by the U.S. military, referring to situations that could be encountered and it seems that is adequate to actual instable and insecure environment generated by the Covid-19 in the economic field. According to the literature, initially the military institutions have been developing leaders who could lead through a VUCA reality (Schoemaker et al., 2018).

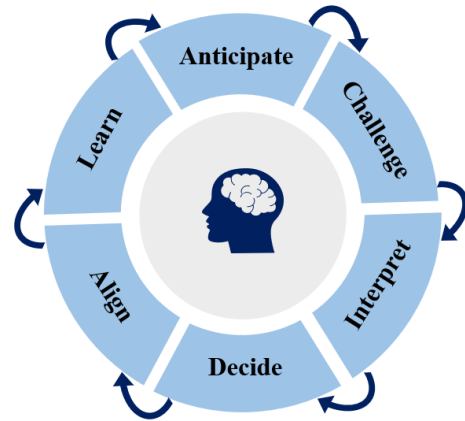


Figure 2: Six leadership disciplines needed for VUCA (adapted from (Schoemaker et al., 2018))

When organizations are in a threat context (e.g., losing clients or key suppliers, losing market share etc.), there were identified six behavior dimensions needed for overcoming the situation (Schoemaker et al., 2018):

1. Anticipate: searching useful and critical information and practices beyond the current boundaries, same time expanding the network of people who can support this action;
2. Challenge: using critical thinking to question the current belief and mindsets, reframing issues to understand root causes, uncover biases and manipulation;
3. Interpret: gathering information from many sources before developing an opinion, understand patterns and test multiple hypotheses;
4. Decide: framing the decision and approach, balance quality and agility, and make commitments even with incomplete information;
5. Align: fostering open dialogue and engage key stakeholders, understand what drives agendas and is hidden, bring in tough issues to pinpoint misalignment, provide a strategic vision;
6. Learn: viewing success and failure as sources of critical insights, encourage transparent communication, stay agile and celebrate success.

Either there are leaders of the organizations or the employees, the six actions to be taken, for transforming an organization under threat or adapting to changing environments, require certain competencies which can be translated into soft skills like critical thinking, cognitive skills, emotional and social intelligence, and ability to adapt to change (Schoemaker et al., 2018).

The post-COVID-19 pandemic business environment brought the VUCA concept to a new level and exposed the vulnerabilities of the companies. The talent pool was reconfigured to be able to handle the crisis overnight. Three additional competencies were found critical and necessary for employees to be effective in an uncertain and novel environment: tolerance for ambiguity, resilience, and curiosity (Caligiuri, 2020). In a rapidly changing business environment, the hard skills are subject to continuous

adaptation and transformation due to automatization and digitalization, many companies turning more to the soft skills as main criteria for talent acquisition and development.

III. THE PROPOSED MODEL FOR TALENT MANAGEMENT

A. Preliminary arguments for neurosciences in HR

From the literature perspective, there have been explicitly recognized that started with Brown et al. (2015) book entitle: “The Fear-Free Organization: Vital insights from neuroscience to transform your business culture”, there are changes in the way in which HR is seen in organization. Further, important studies have provided new methods and tools based on the intervention of the neurosciences in the field of HRM, thus being recognized as having a great potential on supporting employees professional behavior development (in brief presented in Table 1). The results of interdisciplinary research (with the support of neurologists and cognitive sciences) on HR have (re-)confirmed important facts of HRM (which has

been enriched and expanded): all human thinking, actions and feelings are based on emotions (also stated by the researches of Rock from 2006 till 2010):

- HR practices that induce emotions of avoidance or escape (fear, insecurity, anger, disgust, shame and sadness) are counterproductive, because the individual will develop a survival behavior;
- On the other hand, it is much more productive to induce in work groups (generalized in the organizations) emotions related to attachment, growth, involvement, prosperity (joy, trust, love, appreciation, recognition) which stimulates creativity and increases individuals’ ability to operate and to act in effective manners.

Early models in psychology described human behavior in terms of stimulus and response. However, advancements in psychology and neuroscience have shown that several stages fall in-between stimulus and response. As seen in Figure 3, SAFE-TBO model states that, initially, information is filtered through our attitudes before being processed as feelings, emotions and thoughts; the response to this is our behavior, from which there is an outcome.

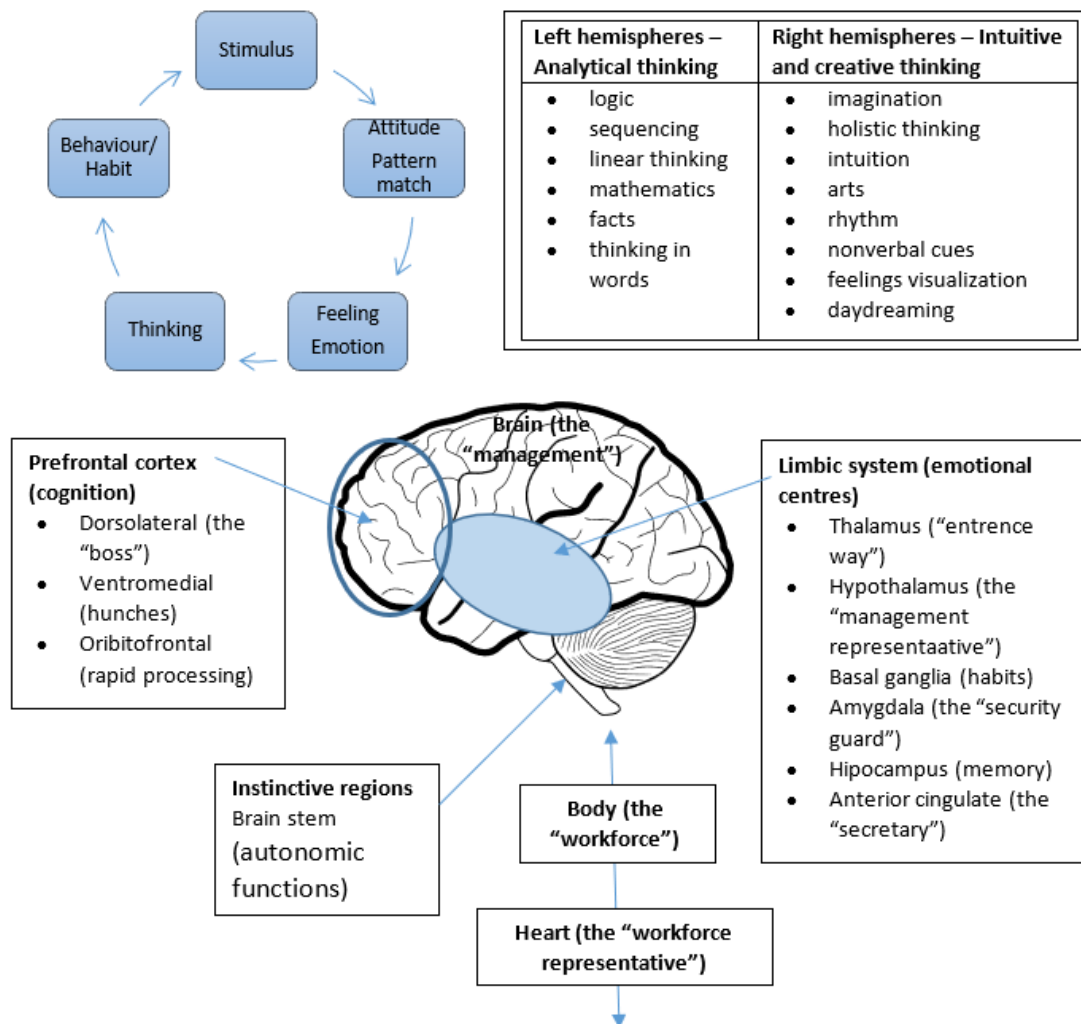


Figure 3: The SAFE-TBO model and the reflection of the brain involvement in behavior (basics of neurosciences)

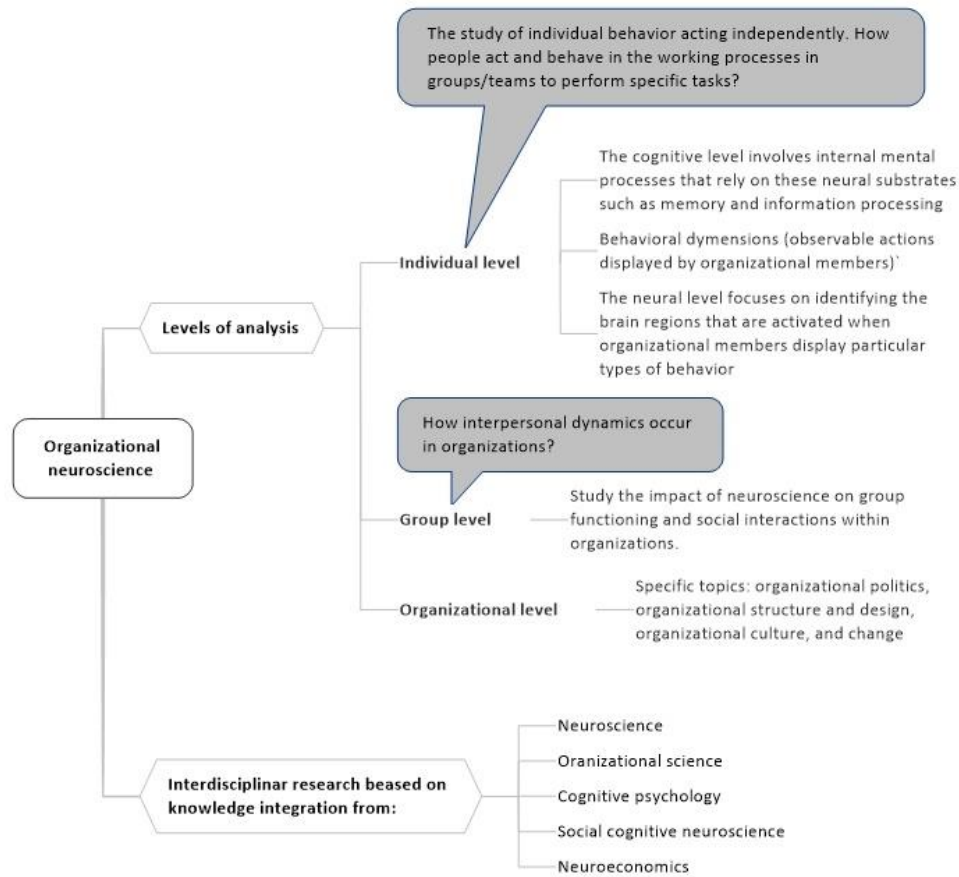


Figure 4 The organizational neurosciences as interdisciplinary science (synthesis from (Beugré, 2018))

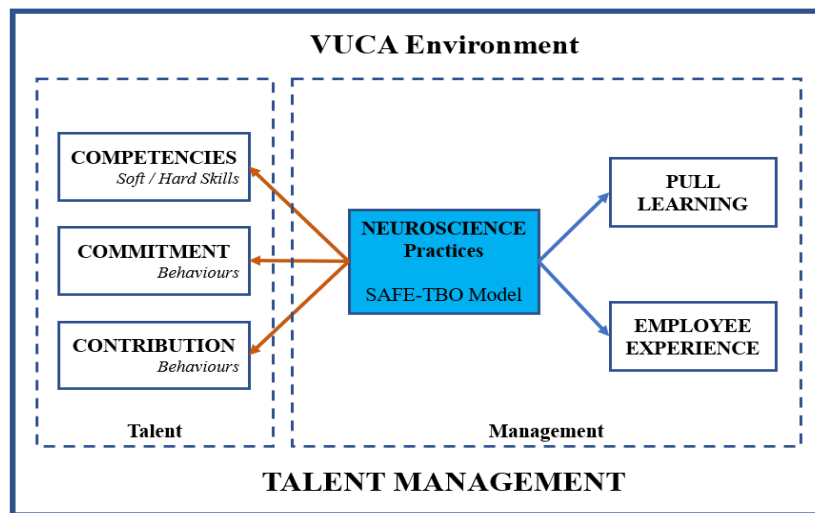


Figure 5: The proposed model for Talent Management

Table 1. A synthesis on existing studies in HR using methods and tools of neurosciences

Year	Models, methods and tools of neurosciences	References
2006 - 2007	Introducing a brain-based approach for observing and supporting individual behavior change needed in an organizational context Presentation of Four Faces Insights Model	(Rock & Schwartz, 2006; Butler & Senior, 2007)
2008	SCARF model (developed by David Rock one of the first pioneers in neuro-leadership) use the application of neuroscience in studying leadership and in coaching practices. The SCARF model is defined as a brain-based model for collaborating with and influencing others. It outlined several domains of human experience (status, certainty, autonomy, relatedness and fairness), around which our perceptions activate different areas of the brain. This determines how individuals react, stimulating either a <i>reward</i> or <i>threat</i> (or <i>fight</i> or <i>flight</i>) response.	(Rock, 2008)

2009-2011	Identify and characterize the neurosciences support for management. Introduce the brain-based alternate approach that can radically improve the performance management ability of leaders in modern-day organizations. Researchers have documented that the threat response is often triggered in social situations, and it tends to be more intense and longer lasting than the reward response. Data gathered through measures of brain activity (using functional magnetic resonance imaging, fMRI and electroencephalograph, EEG) suggests that the same neural responses that drive individuals toward food or away from predators are triggered by their perception of the way they are treated by other people.	(Rock, 2009; Rock, 2010; Rock & Page, 2009; Rock & Larkin, 2011; Becker et al., 2011).
2014	Presentation of the Model of Co-Production in Organizational Cognitive Neuroscience considered as a new neuromarketing research model. According to this, “knowledge is produced in the context of a real-world problem and the theoretical development is co-negotiated with practitioners. The Model of Co-Production reflects this intersection, highlighting both rigor and relevance, or the quest for fundamental understanding and the conditions of use”.	(Butler, 2014)
2014 - 2016	Exploring new frontiers of organizational cognitive neuroscience; the arguments given by the literature review described methods and tools used for neurosciences in economics, in leadership, coaching, building trust, change management etc.	(Butler et al., 2016; Zak, 2017)
2019-2020	Introducing new research perspective with Big Data, Data Analytics and Data Mining. A new ethical context is intensively discuss regarding the use and exploitation of personal and medical data	Fothergill et al., 2019; Martineau & Racine, 2019; Clark, 2020)

The early studies of 2006 – 2011 (Rock & Schwartz, 2006; Rock, 2008; Rock, 2009a; Rock, 2009b; Rock, 2010; Rock 2011) in the neurosciences field and many others now emerging have made one thing clear: The human brain is a social organ. Its physiological and neurological reactions are directly and profoundly shaped by social interaction. Indeed, as Lieberman puts it, “Most processes operating in the background when your brain is at rest are involved in thinking about other people and yourself”. This presents enormous challenges to managers. Although a job is often regarded as a purely economic transaction, in which people exchange their labor for financial compensation, the brain experiences the workplace first and foremost as a social system. Like the experiment participants whose avatars were left out of the game, people who feel betrayed or unrecognized at work (e. g., when they are reprimanded, given an assignment that seems unworthy, or told to take a pay cut) experience it as a neural impulse, as powerful and painful as a blow to the head.

Most people who work in companies learn to rationalize or temper their reactions; they “suck it up,” as the common parlance puts it. But they also limit their commitment and engagement. They become purely transactional employees, reluctant to give more of themselves to the company, because the social context stands in their way. Leaders who understand this dynamic can more effectively engage their employees’ best talents, support collaborative teams, and create an environment that fosters productive change. Indeed, the ability to intentionally address the social brain in the service of optimal performance will be a distinguishing leadership capability in the years ahead (Rock, 2011).

Cognitive sciences contributions in HRM are already well recognized by the literature but there is a

new emerging perspective that have been introduces by the neuroscience, and most by behavior neuroscience (Becker et al., 2011; Butler et al., 2016; Londhe, 2018). Organizational cognitive neuroscience has been recognized and defined as “applying neuroscientific methods to analyze and understand human behavior within the applied setting of organizations. This may be at the individual, group, organizational, inter-organizational and societal levels. Organizational cognitive neuroscience draws together all the fields of business and management, including their operation in the wider social world. It does this to integrate understanding about human behavior in organizations and, consequently, to more fully understand social behavior” (Butler & Senior 2007). Furthermore, different neuroscientific methods and techniques were applied in the study of organizational phenomena, most being dedicated to economics and marketing given the fact that neuroeconomics and neuromarketing are already well-known research areas (Butler et al., 2016), but less studies address HRM aspects.

Figure 4 presents and overview of the organizational neuroscience interdisciplinarity together with the possible levels of analysis (Beugré, 2018). In addition, important findings in the field were published by the NHRD Network Journal, Volume 11 Issue 4 (October 2018), a special issue entitled “Neuroscience and HRM” (Guest Editors: Gopal P. Mahapatra and Shruti Tewari). The main fields of research were: “Neuroscience of Leadership and Coaching” and “Managing Emotion Through Neuroscience”, but a collection of valuable book review have been added.

B. Neurosciences in TM

A study done in 2017 on 117 Chinese manufacturing companies (located in Shanghai and Suzhou, areas considered important economic hubs)

has examined the effect of external knowledge management and talent management strategies in Chinese manufacturing firms. This study underlines that China manufacturing companies' demand and supply of talented employees were proven unbalanced; due to brain drain and knowledge, China was facing a shortage of talented employees. In addition, the empirical study confirmed that both talent management and knowledge management contribute positively to the performance of manufacturing companies, if included in their strategies (Ali et al., 2017). Complementary to these facts, a recent study of Iqbal and the collaborators (2020), conducted across a few rural and urban areas in China with a sample of 2077 young, well-educated and highly skilled respondents, showed as well a brain drain, as the human resources find better compensation, education and lifestyle outside their country (Iqbal et al., 2020).

From the strategic perspective of the HRM literature there have been recognized that

well-developed practices can have a positive effect on companies' performance indicators, but it seems there is no clear theory or principles on how to manage the talent pools (Lewis & Heckman, 2006). Thinking beyond the normal talent shortage in a dynamic and competitive business environment, COVID-19 pandemic brought additional challenges with a strong impact, forcing companies to reassess their priorities related to HR and finding better ways to TM.

Having as base the talent definition given by Formula (1) and considering the current disruptive business environment, we were looking towards finding a new model for better management of the skills and behaviors needed from employees, thus for TM (Figure 5). Leveraging the neuroscience practices, we are considering that two main elements (pull learning and employee experience) can have an impactful influence on peoples' competencies and behaviors.

Figure 5 illustrates the main elements of the proposed Model for TM and how they are framed into the TM structure within the current and future VUCA environment. We considered that a simplified general approach was necessary, so can be applied to all kind of organizations within every industry, being subject to further development according to the business specifics.

Neuroscience, that studies how the brain is functioning, has been used for years for personal improvement, for facilitating change and decision making, problem solving, emotional control, and boosting collaboration. Over the last years, new information about the brain science and human behavior was released and continue to be made available, giving interesting details on the learning process and what motivates people (Sloman et al., 2020). We can often identify a gap between science and business reality. To close it, we have now the opportunity to use some of the well-known neuroscience practices considering the SAFE-TBO model. The way in-house talent is managed can be

readjusted and their performance can be increased if we analyze and consider the employees' attitude towards work, therefore their behavior.

Considering the customer needs and combining best practices from the business with the scientific discoveries, we can upgrade the existing methods and processes of any organization.

Knowing that 95 % of the brain activity is unconscious, only through proper training and motivation we can target to reach the full potential of the employees. Automatization and digitalization support the linear thinking; therefore, the HR professionals and business leaders should focus on increasing agility, creativity, and intuition of employees by re-educating themselves in using specific neuro-techniques (Pillay S., 2016).

Pull learning strategies consist in creating an ecosystem of on-demand learning resources, with many options to choose from and with possibility of the employees to decide what is useful and relevant for them. Being independent to choose on their own, they will feel empowered and more likely to put the learning into practice, and as result to have better performance on the job and an increased engagement. There are at least five reasons for which one individual will adopt a pull learning mindset: curiosity, staying relevant, thinking and innovation, just-in-time need, growth and earning a certification (Prester, 2015). Extracting only growth from the list of reasons, if considered as one of the companies' values and cultivate it continuously, can support employees to believe their talents can be developed through hard work, good strategies, and feedback from others. The growth mindset will have a positive influence on increasing the effort, the interest in learning and commitment to the job (Dweck, 2016).

The people with a growth mindset does not have in mind incentive rewards as the outcome but focus on the work and development. They have a high intrinsic motivation that drives their behavior towards developing their competencies, learning more and adopting change when needed. Dopamine, as the predominant neurotransmitter in the brain, influences the reward and pleasure centres, as well as the emotional behavior and motivation. Dopamine neurons that are influenced by unexpected rewards, have an impact on behaviors and engagement. People are more likely to make voluntary commitment to a job task if is a free choice involved and autonomy is recognized. This strongly supports the intrinsic motivation, therefore the learning willingness (Ng, 2018).

One important role of HR practitioners is to understand how the employees are feeling about the company, what are their challenges and their expectations. Once it is understood how the organization and working environment is perceived, HR can leverage neuro-scientific techniques for improving the employees' journey, to support them navigate better through disruption, transformation, and uncertainty, same time facilitating their development. The employee experience is strongly linked with commitment and contribution, as well as with the

development of competencies through continuous learning.

IV. CONCLUSION

Despite the global HR crisis of the last years, which have been accompanied by the TM crisis managers concerned on HRM problems are still actual. The dynamic business context that can be defined as a VUCA environment and current crisis generated by the COVID-19 pandemic are challenging the leaders' decisions on how to increase efficiency and effectiveness of TM. Employers recognize that an engaged, skilled and motivated workforce is the key to growth and to achieve competitive advantage. The crisis, however, impels organizations to be more creative and effective in their TM approach. From the literature perspective, the academic research in the field of TM has not provide a solution to the TM (in terms of a generalized model, effective methods and tools). In fact, intensive research on TM over the last ten years, do not established any consensus on its definition, theoretical backgrounds and scope.

Nowadays, soft skills are gaining more importance than ever, and organizations are reassessing the required competencies within an uncertain business environment, considering new ways of working. When companies are lacking talent with the necessary competencies identified for great business performance, they become vulnerable whenever a crisis occur, and not be able to detect the threats, nor opportunities to overcome the challenges.

As there is little empirical evidence that would support the traditional view of talent according to which people have special innate abilities that lead to exceptional performance, it would be recommended to focus on learning methods and employee experiences that support improved human performance (Hambrick et al., 2016). The "learning pull" approach rather than "technology push" is preferable to be adopted, fostering a growth mindset within the organizations, and facilitating self-paced development through a strong learning management system.

We believe that taking into consideration the proposed framework, by using the neuroscience practices for TM through the glasses of SAFE-TBO model, organizations will be able to keep their competitive advantage when crises occur and even become more successful. The proposed model will be subjects to further research.

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A Bibliographic Study on the Use of Communication in Relation to the School Relationship - Coordinating Institutions

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Abstract – Schools have a certain status at the community level. They must ensure their existence as an organization, and this depends on how well they adapt to the external environment. They must communicate effectively with these environments. The paper presents a bibliographic study on the external communication carried out at the level of educational institutions and aims to identify how this is reflected at the level of each stage of education in Romania. The realization of this study determined the conceptual analysis of the communication process within the school relationship - coordinating institutions and the formulation of the following conclusions that may constitute the theoretical foundation of the future research. In most institutions the communication process is not transparent. The deficiencies of communication are reflected in the image of the school, which is often at the disadvantage of the unit. This is not a substitute for a strategic plan. There is a lack of agreement in the communication between the levels of education: from the mayor to the secondary school, high school, and university. These observations support the choice of the research topic, as one of the impacts on the pre-university education institutions, on the community and the family of the beneficiaries.

Keywords communication, management, education institutions, pre-university, external communication, conceptual analysis

I. INTRODUCTION

The bibliographic study on the use of communication in the relationship between schools and the coordinating institutions falls within the field of scientific research in Engineering and Management as a general field, and in the field of human resource management as a specific field of research.

Within any institution in general, and therefore the institutions that govern the educational field, communication is, along with professional motivation and competence, "the key to organizational excellence and effectiveness" (Grunig, 1992) [6].

The objective of the paper is to provide a scientific basis for analysing how communication is managed externally in pre-university education institutions. The motivation for choosing this topic starts from a real fact, which is that educational institutions are subject to a permanent process of change and rapid adaptation.

This implies the identification of mechanisms for adaptation to the new, of the barriers and factors that influence communication, of the strong points of external communication and their replication at the level of other institutions in pre-university education in Romania. The methodology approached in the paper consists in structuring the bibliographic study on the aspects presented in the research, within the direction of using communication in the school - coordinating institutions relationship.

II. BIBLIOGRAPHIC STUDY ON COMMUNICATION IN GENERAL, AND IN THE EDUCATIONAL PROCESS IN PARTICULAR

The analysis aimed to highlight, on the one hand, the way in which external communication from the school level is reflected in the specialized literature, and on the other hand, to find out what is the preoccupation of pre-university education institutions towards the communication with higher level institutions, the inspectorates and the ministry. The review was diverse and included a variety of document types (books, academic articles and popular journals, institution websites, documents published on these sites).

Recent studies address the communication process between schools and coordinating institutions (school inspectorates and ministry) from the perspective of decentralization. According to Hunt (2007), educational systems tend to operate on three interconnected levels: a) the macro level - where

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national policies are developed and negotiated; b) the middle level - which oversees the implementation of national policy; it is often located in the equivalent of provincial / local education departments; c) the micro level of schools and communities that implement the policies and where the change of practices in education takes place. Thus, the communication takes place from top to bottom, as the national and county authorities will implement and evaluate the adopted educational policies. However, the need for bottom-up communication has been increasingly recognized, starting with the fact that the responsibilities in the education management are apparently shifting to the school and community level. He notes the need to develop communication skills between the three levels of education, as well as the need for communication spaces and opportunities [7].

The communication with decision makers can take various forms, such as: consultation processes; public participation; global campaigns and links between research policies from the perspective of the educational sector.

Schleicher illustrates the involvement of communication in the process of implementing governmental educational policies. It shows how the communication policy has changed the nature of the conversation about the educational reform in the United States [15].

Keating analysed how the new evaluation system was developed and implemented at the level of four schools in different parts of the United States and highlighted the role of two factors in this process: trust and communication [9]. The collaboration between the determinants of this process was based on an open and honest communication. In addition to the communication accompanying the evaluation activity throughout its development, the report presented by Nusche et al. (2011) in Norway recommends further collaboration between national authorities and schools based on a clear communication of the significance of the evaluation results applied at national level [12].

In the consultation process, Finlay emphasizes the importance of two-way communication, but which is resumed in an iterative approach. This involves the following steps: listening, communication, feedback, communication and listening again [5].

III. THEORETICAL CONSIDERATIONS REGARDING THE COMMUNICATION PROCESS BETWEEN EDUCATIONAL INSTITUTIONS

3.1. Types of external communication

A classification of external communication starts from the idea that communication is not strictly managerial. Annie Bartoli identified the following types of external communication:

- *Operational external communication* (between the members of the organization with interlocutors from outside the organization);

- *Strategic external communication* (building or expanding a communication network);
- *Promotional external communication* (advertising, public relations).

Thus, the promotional external communication at the level of educational institutions can be managed through various strategies. The first involved in this type of external communication are teachers who display an image of the institution voluntarily, through the type of relationships established with partners. The personal image they build on a social level is also reflected on the institution.

Strategic external communication involves building relationships with various actors in the social environment, but also anticipating the evolution of the relationships, the changes that may occur and that could impact the image of the institution. The promotional external communication presupposes that the school offers aspects of interest to the public (mission, vision, values and results obtained). This type of communication results in increased mutual trust between the beneficiary and the partners or between the beneficiaries of education and the offering institutions.

Thus, the management of internal and external communication by diversifying the ways of working with partners leads to an efficiency of the entire activity in a school institution.

3.2. The legal basis of communication at the level of the institutions that govern the education process

In Romania, the documents that rule the communication process at the level of educational institutions are presented in the form of laws, orders, ordinances, norms, regulations, methodologies, such as:

- National Education Law no. 1/05.01.2011 with subsequent changes;
- ORDER no. 5079 of August 31, 2016 regarding the approval of the Framework Regulation for the organization and functioning of the pre-university education units, with the subsequent modifications and completions, brought by OMEN no. 3027 of 2018;
- Law no. 544/2001 regarding the free access to information of public interest;
- Methodological norms for applying Law no. 544/2001, regarding the free access to information of public interest, approved by the Government Decision no. 123 of February 7, 2002;
- Regulation of organization and functioning of the pre-university education units no. 5079/2016 - with the subsequent modifications and completions.

3.3. The communication model at the level of the institutions that govern the educational process in Romania

The study presents the results of the bibliographic analysis performed on the documents that regulate the management activity. For each type of institution, we analysed the specific documents, highlighting the data on the external communication process. These were

extracted from the websites of pre-university educational institutions (high school, middle/secondary school, and primary school levels), of the school inspectorates and of the Ministry of National Education. These documents are the management plan, the institutional development project, the operational procedures.

The following figure shows the way in which the communication process between the analysed institutions is carried out. (Figure 1).

3.4. The Ministry of National Education in Romania

The Ministry of Education and Research developed in 2006 the *Communication Strategy for the pilot projects of decentralization in the field of education* in Dolj, Iași and Harghita counties, which is a tool that aims to improve the information and communication process during the pilot project of decentralization of a number of 50 schools from Dolj, Iași and Harghita counties [11]. This document shows that at the level of the Ministry there is a team of 20 people who make up the Communication and Public Relations Department (public relations), with five subunits (press office, public relations office, archive, telephone operators, customer service, copying documents). Through this Office of Communication and Public Relations, the entire external communication of the institution takes place.

Other current communication activities that take place at the level of the Ministry are daily press review, intranet, meetings, and encounters at the level of the director/manager, distribution of decisions in written format to the directors/managers.

According to the last point of the presented strategy, an information and communication body will be implemented. It will be composed of communication inspectors, who, based on a communication plan, will “define the objectives, target

groups, communication channels and activities addressed to the partners at the county level and the pilot schools / communities”.

Vertical communication with schools takes place through School Inspectorates. The information is taken over by the general school inspectors and the school subject inspectors, being then transmitted to the specialized inspectors and later to the schools.

The Ministry has a site through which it communicates with the public, <https://www.edu.ro/>, an interactive site that also contains a forum - www.portal.edu.ro. The means of communication used are email, telephone, fax, registered documents, other digital tools.

The analysis of the management plans of the universities shows that the communication process is based on the Active Dialogue with the society — which shows the importance given to it: “The connection between the society and the university becomes, in the modern world, a bivalent necessity, on the one hand, the university to its needs and aspirations, and on the other hand, the university must adapt its existence to serve the public interest” [5].

Universities aim to communicate with partners, but also with other institutions (Figure 2) by setting up a *Center of communication with the socio-economic environment*, with its own headquarters, technical support, and staff. Other directions are [5]:

- Concluding cooperation protocols with companies;
- Establishing partnerships with organizations;
- Creating databases;
- Organizing meetings with representatives of the socio-economic environment;
- Maintaining contact with the central and local public administration, agencies, authorities.

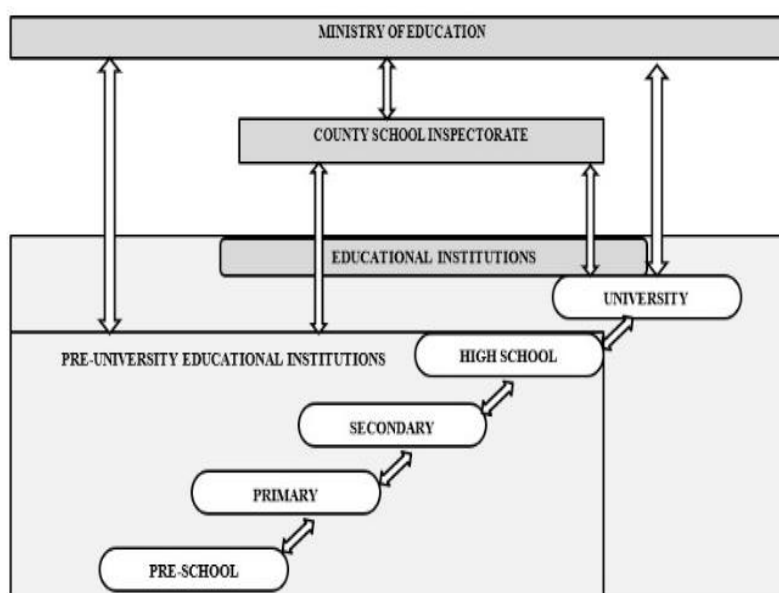


Fig. 1. Communication model of pre-university education institutions - coordinating institutions

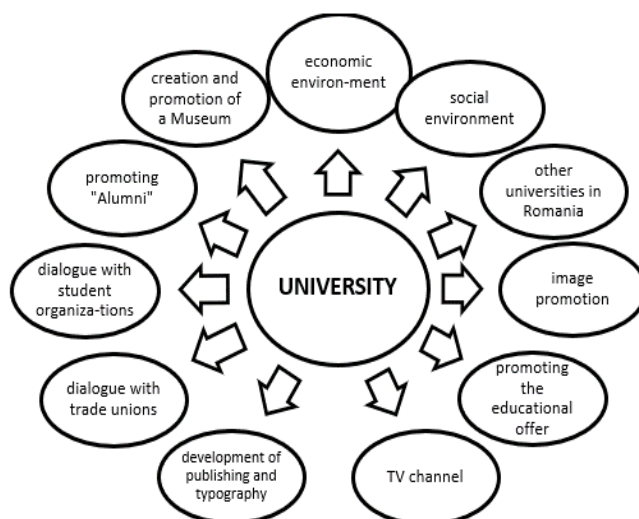


Fig. 2. Forms of communication between the University and the community (adapted after Costoiu, M., 2012: p. 24)

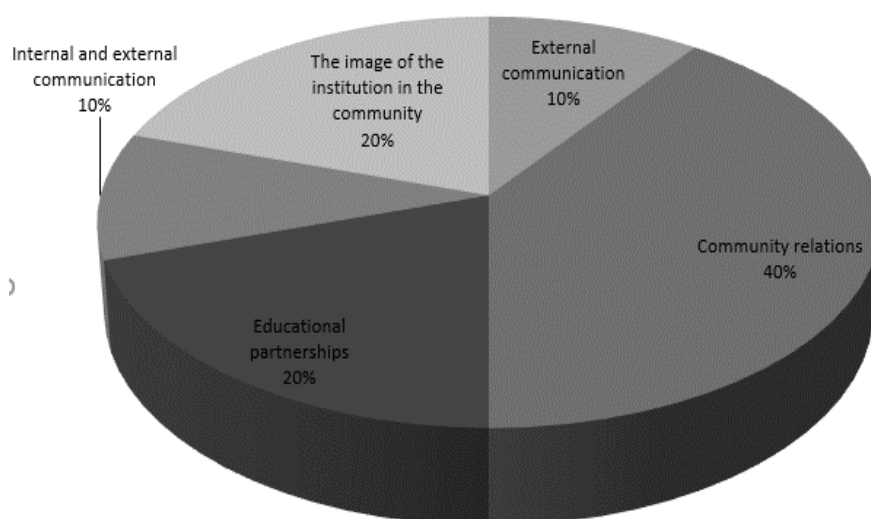


Fig. 3. Communication in the ISJ Development Plans

Table 1. Regulation of the communication process within the procedures developed at the level of pre-university education institutions

<i>Nr. crt.</i>	<i>Level of education</i>	<i>Regulation of the communication process</i>
1.	High school level	<ul style="list-style-type: none"> - the communication is approached in a single procedure, but which includes references to several aspects of the communication at the level of that institution (an example would be the communication with the media) - does not capture all categories of dialogue partners with which that institution is linked
2.	Secondary level	<ul style="list-style-type: none"> - both internal and external communication are described - the actions are formulated in a general way - there are no specifications for communication with parents or students - the preoccupation for establishing the relationship with the community and with the institutions predominates
3.	Primary school level	<ul style="list-style-type: none"> - communication is focused on one direction: that of promoting the image and activities of the school

3.5. Higher education institutions

From the documentary research at the university level, it results that the communication process remains

an important side of the management of higher-level institutions by the fact that it is found in all the analysed documents.

3.6. School Inspectorates

There are 47 school inspectorates in the country, corresponding to the territorial administrative organization. For each of them there should be an inspector on communication issues, according to the document prepared by the Ministry. Also, here it is specified that their training will be carried out within the Communication and Public Relations Department, but as mentioned in the same document, they are not active in all Inspectorates.

They operate based on Order No. 5530 of October 5, 2011 on the approval of the Framework Regulation for the organization and functioning of school inspectorates. This order defines external communication as being carried out with different types of public, among which the Ministry of Education and Research is mentioned. The media is a channel of communication.

The managerial plans displayed on the websites of 8 school inspectorates were analysed. It was found that only in some of them does the communication appear as a clearly formulated direction. It should be noted that there are school inspectorates in whose management plan there is no reference to communication.

The analysis highlighted the following aspects:

- The communication does not appear explicitly in the directions of action of the inspectorates;
- When the communication aspect is highlighted, it is inconsistent, with each institution considering a different target audience;
- Official documents are not found on some sites;
- Not all inspectorates present the media relations section;
- The spokesperson of the institution is not presented.

The institutional development project is designed for a period of 3-5 years and is a document that regulates and guides the activity of the institution.

The analysis of this document showed that 10% of the institutions clearly defined a communication objective, and another 10% formulated a common objective for internal and external communication (Figure 3).

Another document that presents the directions of interest of an institution is *the management plan*. The analysis showed that in this document there is no main objective to communicate, but in some it refers to partnerships and community relations. On the other hand, the secondary objectives include various aspects related to communication.

One observation is that documents do not regulate all aspects of communication. We have the example of the site: this is a means of communication used by all institutions subject to research, but it is mentioned in only two of them and defined as an objective in the management plan.

3.7. Pre-university educational institutions

At the level of pre-university educational institutions, the specific documents: the institutional development project, the operational plan, the

management plan, the operational procedures, constantly include aspects related to the regulation of the communication process, both internal and external.

The institutional development project regulates and guides the activity of the institution. Conceived for a period of 3-5 years, it has a prognostic character and appears mentioned in the *Regulation on the organization and functioning of pre-university education units no. 5079/2016, Art. 33*, together with *the operational plan* and *the management plan*. According to the Report published by the National Institute of Sciences, "it is based on the analysis of the current level of performance, assesses how current trends and factors that will act in the future may have an impact on the school and sets priorities and targets for improving future school activity" [8].

In its context, the communication aims at the relations with parents, community, local authorities, economic agents, other educational units, partnerships, projects. Of these, the largest share has the direction of community relations, followed by educational partnerships.

At the level of secondary education, we have a limitation to two objectives, while, at the preschool level, a diversity of directions is observed. We also encounter a situation at the level of primary education which does not include in the development plan any of the objectives listed or with reference to the field of communication.

The management plan is the document that should contain a communication plan in the form of a chapter, according to the document entitled *Communication strategy for pilot decentralization projects in the field of education in Dolj, Iași and Harghita counties* ".[11]

The websites of high school and secondary school institutions have published these documents. The central point of external communication is the elaboration of a budget plan, which has the effect of close communication with local partners.

The analysis of the procedures at the level of pre-university educational institutions was performed separately for the high school level, the secondary school level and primary school level. (Table 1) There are two types of procedures: system procedures and operational procedures. They reflect the two types of communication: internal and external. Target receptors are made up of parents, other institutions, local authorities, employers, local community.

IV. EXTERNAL COMMUNICATION AND ITS INFLUENCE ON PRE-UNIVERSITY EDUCATIONAL INSTITUTIONS

Following the analysis of the managerial documents, we made a diagram in which *the communication directions between the pre-university educational institutions and other institutions* can be observed. (Figure 4) Another aspect aimed at presenting the tools used in the external communication process at the level of educational institutions in Romania.

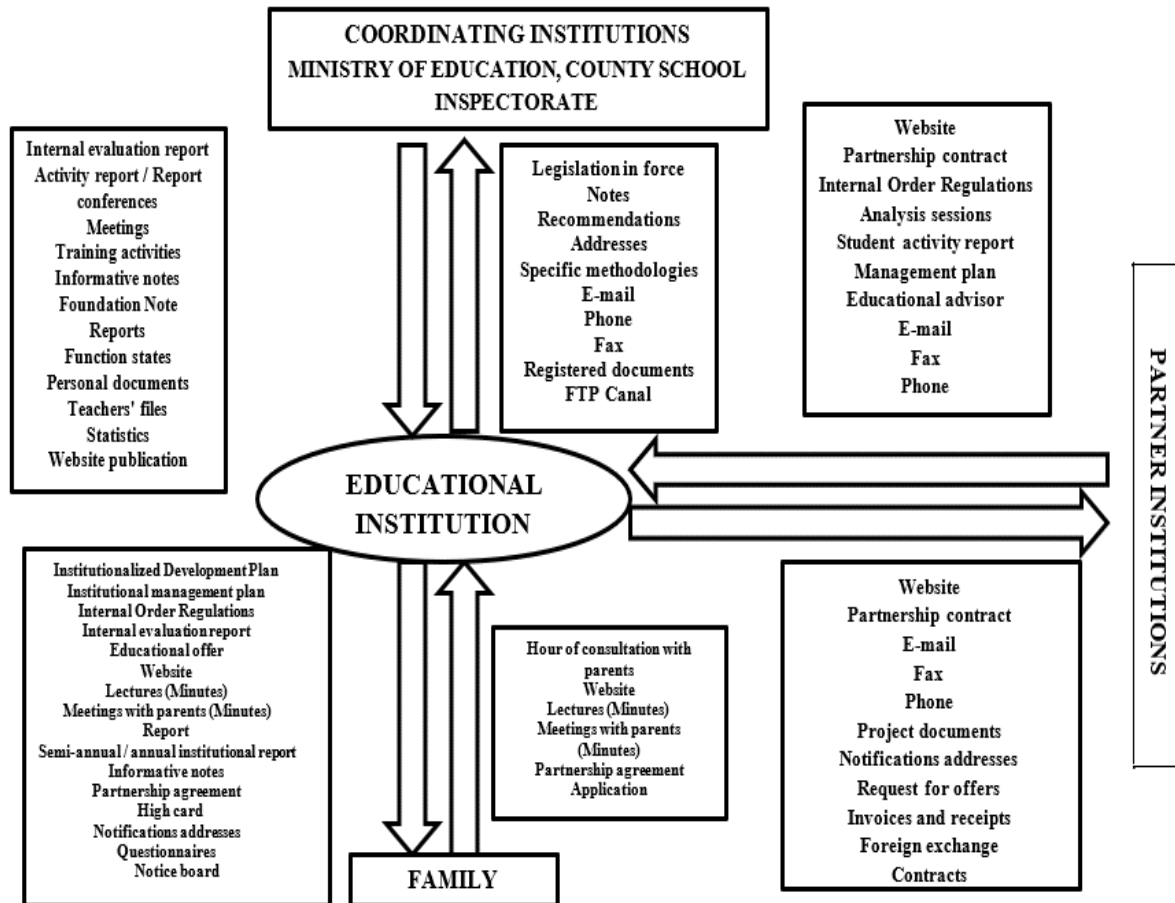


Fig. 4. Forms of external communication from the level of educational institutions

The special status that schools have within a community determines the personalized nature of external communication. The adaptation of institutions to the external environment represented by organizations, people, and other diverse environments, give efficiency and ensure its survival.

Oliver defines external communication as that which occurs between managers and people outside the organization [13]. It is the exchange of information and messages between an organization and other organizations, groups, or individuals outside its formal structure which, in turn, may be local, national, and international. Kiriago points out that, when used professionally, external communication projects a distinctive image of the school in the community, leading to an increase in prestige [10]. The concern of all school members, staff and students for proper external communication must be preceded by good internal communication. Thus, everyone contributes to the perception of the school as a strong and competitive institution in the field of education.

The researcher concludes that, in the process of managing the image of the school, the fundamental variables are identity, corporate communication, corporate image and feedback. Therefore, school managers should be aware of the effects of any form of communication that comes from their schools. He, consequently, recommends that the staff should be trained through training programmes, workshops,

seminars on how to manage public relations, and that there should be a public relations person at school level [10].

V. CONCLUSIONS

The analysis carried out on the specialty literature revealed, on the one hand, *the importance of external communication at the level of educational institutions* whose beneficiaries are the students, the parents and the society, and on the other hand the fact that *the management documents of institutions contain insufficient data on the directions for this type of communication*.

The present research has shown that there are major differences in the communication approaches for each level of education. It was found that at the preschool and primary levels, there are no clear objectives regarding external communication. The partners referred to are the family and several community institutions.

The documentary research allowed a structuring of the regulations of the communication at secondary and high school levels, observing a more careful approach to external communication and a denser reflection of it in the management documents of pre-university educational institutions.

The bibliographic-documentary study showed that the promotion of external communication models, the

improvement of the existing ones, their inclusion in the management documents can lead to the improvement of the external communication at the level of pre-university educational institutions.

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Business Ethics in Norway: History of Business Ethics in Norway and Guidelines of Council on Ethics for the Government Pension Fund Global

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Abstract – The aim of this paper is to present business ethics as practiced in Norway. Based on an article published in 1959, a vision of business ethics history in Norway under the rise of industrialism is described. Subsequently, the role of the Council on Ethics for the Norwegian Government Pension Fund Global (GPF) is explained and its guidelines are presented. Aiming to obtain an overview of business ethics in Norway during both industrial and modern era and understand how views have changed during the time, a comparison is conducted.

Keywords Business ethics, business ethics in Norway, council on ethics, ethical guidelines, business, ethics, Scandinavian business

I. INTRODUCTION

Business Ethics, as a term, might be confusing to an individual at first glance [5]. Viewing business and ethics as two opposing concepts that can hardly be interrelated is nothing new. A business is defined as an organization or form of economic activity engaged in commercial, industrial, or professional activities, being governed by inputs and outputs. On the other hand, ethics is described by the Macmillan Dictionary as a set of principles that people use to decide what is right and what is wrong. Further, Gavai (2010) argues that business is part of human life and business organizations do not exist and function outside the society [5]. Thus, businesses must follow concepts such as good and bad developed by the society.

Clark (2013) cites Bednarz who is of the opinion that business ethics is no different than human ethics and that the same high standard should be applied to both [3]. Thus, each organization and all its employees must conduct their affairs with uncompromising honesty and integrity. Furthermore, Bednarz suggests that employees are representing the company, thus they are required to adhere to the highest standard, regardless of local customs [3]. He further presents an interesting view stating that while certain actions might

be legal, they might also be unethical at the same time [3]. If such activities are accepted, a corporate culture is generated that undermines the trust of the consumer in the business, goods, and services, and ultimately damages the company's credibility on the market.

The objective of this work is to present business ethics as practiced in Norway by reviewing an article about business ethics in Norway during the rise of industrialism and by presenting the guidelines of the Council on Ethics for the Norwegian Government Pension Fund Global (GPF).

When it comes to business culture and ethics in Norway, it can be said that it is like other Nordic countries and that it is based on Scandinavian work values. Here, the business cultures were shaped during the years by the Law of Jante, Janteloven, which is a code of conduct known in Scandinavia. It labels not conforming, out of the ordinary and individuality as unworthy. Thus, it suggests that an individual should put society ahead of himself, should not be overly ambitious and should blend into a conformist homogeneity. Moreover, individuals are valued for their kindness and honesty while their professional role is not necessarily used to create judgments and form opinions.

As said, Norwegians are less impressed by titles and power than in other countries and focus on equality. As a result, there are small differences in society and work environments. Confidence, on the other hand, concerns the authorities as well as the residents, employers, and workers but also business associates. Cooperation can also be effective without creating too many frameworks between business partnerships. Moreover, cooperation between the government, employer federations and employee syndicates are a key element of this model.

Having described the Nordic mentality and code of conduct, it is interesting to link them to two factors described by Gavai (2010) as factors affecting business

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ethics. The ethical climate of a country and the personal code of behaviour of the individual are some of the factors described in his book as factors that affect business ethics [5]. Furthermore, Gavai (2010) argues that the moral standards of a society reflect in the morals of the business standards. While the general environment in a specific country together with society's moral conduct have a deep influence on business ethics [5]. Linking these factors to the Law of Jante, a clear conclusion can be drawn. Within Norwegian business ethics factors such as ethical environment and an individual's personal code of conduct cannot be considered an issue. In addition, the Nordic countries are known for low corruption rates. According to the Corruption Perceptions Index 2019, Transparency International's flagship research product, Denmark ranks as #1 with 87 out of 100 points, Finland as #3 with 86 points, Sweden as #4 with 85 points and Norway as #7 with 84 points [13].

The outline of this paper is as follows: "History of Business Ethics in Norway" section presents ethical principles in Norway during the Industrialism. "Role and Guidelines of the Council on Ethics for GPFG" section aims to describe the role of the Council on Ethics of Norway and present its ethical guidelines. "Business Ethics in Norway, Then and Now" section highlights how views have changed during the time. Lastly, final remarks and conclusions are delivered.

II. HISTORY OF BUSINESS ETHICS IN NORWAY

In the publication entitled "Business History Review" published by Harvard University Graduate School of Business Administration, the Rector at The Bergen School of Retailing wrote an article reviewing business ethics in Norway under the rise of industrialism, 1880-1950. During this section, the presented topics from the article are discussed.

In "The Business History Review 33" (1959) Lunde states the beginning of his article the fact that the theoretical investigation of commercial conduct and the formulation of business ethics, described as commercial principles, have been neglected in both the research field and as a subject for instruction [11]. The Rector further states that one of the main reasons for this is the difficulty to determine standards of values on which business ethics should be based. Moreover, he is of the opinion that the traditional Christian and bourgeois way of life in Norway was replaced in the 1870s by the moral relativism introduced by the combined influence of materialistic philosophy, classical liberalism [11].

By the time the article was published, in 1959, Lunde considered that during the last decade, the spontaneous recognition of basic ethical principles has become easier. The self-limitation of science, reshaping of liberalism and the replacement of Marxism by a social-democratic ideology are viewed as the main factors of this change. Combining the triad

of the ancients "Truth, Goodness and Beauty" with the Norwegian poet Wergeland's "Freedom, Truth, and Love", Lunde (1959) argues that the basic values might be summarized as "Truth, Justice, Freedom, and Solidarity" [11].

Furthermore, Coates states that Max Weber approves and quotes Tolstoy's words: "Science is meaningless because it does not answer our question, the only question important for us: What shall we do and how shall we live?" [1]. Thus, for Max Weber, science can offer no guidance on fundamental value-preference questions. In a similar manner, with few to no studies of business ethics available at that time, Lunde (1959) explains how researchers supported Max Weber's statement that as science cannot preach morals, business ethics must be strictly descriptive [11]. Before proposing standards of business ethics, Lunde (1959) affirms that the 1900 – 1915 moral reconstruction of business ethics standards was a virtue of necessity. So, even if it was done through industry and trade circles, it was society and its customers that compelled the corporate community to pursue a different course of action towards improving business ethics [11]. The author presents a proposal for business ethics standards that are defined by three main categories.

- The first is "Truth" and is further divided into "Honesty, Integrity, and Confidence".
- The second category refers to "Justice (and freedom)" being divided into "Contribution (to Society), Fairness and Moderation", and
- "Solidarity" the third category, further divided into "Usefulness to Society, Service, and Loyalty".

Lunde (1959) subsequently compares his proposal to various vague ethical codes and basic rules of that time and argues that its principles can be refined and improved, thus forming more concrete criteria of business ethics [11].

In addition, the article continues to describe the Better Business Committee of the Oslo Mercantile Association which was established in 1878 at the Annual General Meeting of the Oslo Mercantile Association. The so-called "Committee of Fifty" was constituted by prominent businessmen from different industries. It is stated that the Committee was an advisory body that exercised a considerable influence on the formation of general business practice standards and even on the framing of commercial law [11].

As material for a business ethics investigation, statements submitted to the Committee until 1953 provided cases for determining the moral standards of commercial conduct, with the Committee expressing its opinion on what constitutes "good business practice" and whatnot. With a total number of 566 cases that have been selected and labelled as representative the investigation revealed that 56.6 percent of the cases proved to be ethically negative while 43.5 percent were ethically neutral.

Results of the investigation are presented, and it is argued that the moral crisis in Norwegian business

existed before the First World War. Although the crisis reached its peak during the war, it cannot be labelled as a war-related phenomenon. It is also affirmed that neither can the deviations from the 1940s and 1950s be attributed to the Second World War as their development started before the outbreak of the war.

It is believed that the development of the deviations might have been influenced by the extent to which in large industrial concern, individual ethical responsibility has been rationalized out of existence. The article concludes stating that “the moral judgment exercised in commercial matters in the leading circles of Norwegian commerce and industry is on a high plane and has proved to be little affected by crises and ethical relativism”. This conclusion is followed by a closing remark that highlights the fact that it is time “to commence some form of continues research into business ethics”.

III. ROLE AND GUIDELINES OF THE COUNCIL ON ETHICS FOR GPFG

Nowadays, with the importance of business ethics proven throughout the decades, companies strive to imply general ethical ideas in their business behaviour. As it was previously discussed, historically, ethical standards were imposed by society and its consumers rather than being developed by business circles. However, recent international scandals have damaged the reputation of some of the most important corporate businesses and even public institutions. As a result, companies and governments seek to gain the trust of the society by increasing transparency and proving the use of ethical standards within their practices.

With the name changed in 2006 from the Petroleum Fund of Norway, the Government Pension Fund Global is a fund into which the economic surpluses produced by the Norwegian petroleum industry are deposited. According to the Norwegian Ministry of Finance, the purpose of the Government Pension Fund is to facilitate government savings to finance rising public pension expenditures and support long-term considerations in the spending of government petroleum revenues [9]. Further it is stated that long-term management of the Fund contributes to intergenerational equity, by allowing both current and future generations to benefit from the petroleum revenues [9].

To evaluate the investments of the Norwegian Government Pension Fund Global (GPFG) in specific companies, the Council on Ethics was established. Being established by Royal Decree on the 19th of November 2004, the Council on Ethics has the role to evaluate if the Fund's investment in specified companies is inconsistent with its Ethical Guidelines or not [8].

In a press release of the Norwegian Government in 2014, the positive results of the Council on Ethics are expressed by the Minister of Finance Siv Jensen who said: “The Government is today presenting a report to

Parliament on the management of the Government Pension Fund in 2013 [7]. The Fund has served us well and it gives important contributions to the financing of our welfare state”. During the same appearance, the Minister of Finance announced that the government mandates the management of the current ethical exclusion criteria to Norges Bank [7]. But at the same time, he states that: “Openness about ethical exclusions of companies will still be a key feature in the management of the Fund” and that “The Ministry will appoint a new group of experts which shall assess Norges Bank's work in this particular area” [7]. It is important to mention that Norges Bank Investment Management (NBIM) is part of the Norwegian Central Bank.

Having cleared these aspects, the Council's activities and guidelines are to be presented as provided by the Council's Ethical Guidelines Manual [2]. According to the first section of the manual, these guidelines apply to the work of the Council on Ethics for the Government Pension Fund Global and Norges Bank on the observation and exclusion of companies from the portfolio of the Government Pension Fund Global [2]. The Council on Ethics continuously monitors the Fund's portfolio aiming to identify companies that are responsible for specific misconducts.

Exclusions from the Fund's portfolio or observation decisions are based on various criteria mentioned in sections 2 and 3 of the GPFG's Ethical Guidelines manual. Companies are mainly excluded based on two grounds, product-based and conduct-based. From time to time, there might be cases of uncertainty whether the exclusion conditions are fulfilled or not. Under such circumstances, the company is to be placed under observation.

Section 2, entitled “Criteria for product-based observation and exclusion of companies”, states that the Fund shall not invest in companies which themselves or through entities they control: “produce key components for weapons that violate fundamental humanitarian principles through their normal use; produce tabaco; or sell weapons or military materiel to states that are subject to investment restrictions on government bonds as described in the management mandate for the Government Pension Fund Global” [2]. Furthermore, the Council can exclude mining companies and power producers which themselves or through entities they control “derive 30 percent or more of their income from thermal coal; base 30 percent or more of their operations on thermal coal; extract more than 20 million tons of thermal coal per year; or have a coal power capacity of more than 10 000 MW from thermal coal” [2]. In the same appearance in 2014, the Minister of Finance declared that work will be initiated to further assess the risk from climate change on the Fund's future performance. Moreover, to address climate change, the Ministry has formed a group of experts to analyse if the exclusion of coal and petroleum companies would not be a better alternative than ownership.

The Council of Ethics can also put under observation or exclude companies that contribute to or are themselves responsible for serious violations of norms. These criteria of exclusions are presented in section 3 which is entitled “Criteria for conduct-based observation and exclusion of companies” [2]. On this basis, the Council of Ethics has determined the following criteria: “serious or systematic human rights violations, such as murder, torture, deprivation of liberty, forced labour, the worst forms of child labour; serious violations of the rights of individuals in situations of war or conflict; severe environmental damage; acts or omissions that on an aggregate company level lead to unacceptable greenhouse gas emissions; gross corruption; or other particularly serious violations of fundamental ethical norms” [2].

Both decisions of exclusion and observation of companies are made public. Section 8 regards publication guidelines and states that Norges Bank must maintain a public list of companies that were excluded from the Fund or placed under observation [2]. In addition to the decision publication of Norges Bank, the Council on Ethics must publish its recommendations [2]. Screening through Norges Bank Investment Management’s list of excluded companies, well-known companies such as Airbus SE, Boeing Co, British Amirian Tobacco Plc, Coal India, Honeywell International Inc, Okinawa Electric Power Co, Philip Mors International Inc, Tata Power Co Ltd and many other can be found marked as excluded or under observation.

IV. BUSINESS ETHICS IN NORWAY, THEN AND NOW

An interesting approach by Ihlen’s (2015) work traces the roots of corporate social responsibility in Norway. Even though Business Ethics and Corporate Social Responsibility are two different terms, they are often used interchangeably. As Morales Pedraza (2010) argues, there has always been a contradiction between the two [10]. He further states that what is good for society is sometimes not good for the business and vice versa [10]. However, we saw in a previous section that society and its consumers were the ones who imposed business ethics to Norwegian companies.

Norwegian business environment has been dominated during the years by small and medium-sized companies. According to a Eurostat statistic published in 2018, only 2.5 percent of the approximately 300,000 active Norwegian companies can be characterized as large [4]. Ihlen (2015) cites Thue in his work who stated that while there was a Norwegian aristocracy, much of its nobility was considered poor by contemporary European standards [6]. Ihlen’s (2015) further argues that this had implications for the development of a rather egalitarian society that later would influence the understanding of social responsibility [6].

KOMPakt, a new kind of forum, was organized in 1998 by the Norwegian government to facilitate the communication with Norwegian businesses. The aim was to consult the government on ethical challenges faced by organizations conducting business abroad. Citing the Ministry of Foreign Affairs, Ihlen’s (2015) states that a white paper on human rights and business was issued because of this forum [6]. The paper clarifies the government’s position explaining that Norwegian companies should consider human rights in their business dealings.

Nowadays, organizations such as the above presented Council on Ethics for GPFG are striving to impose ethical guidelines. In addition, ethical business practices are maintained by the Confederation of Norwegian Enterprise (NHO) which aims to maintain and create conditions that protect competitiveness and profitability. By doing so, they succeed to keep an impressive level for a good living standard and economic growth.

V. CONCLUSIONS

With the Norwegian business environment being based on the Scandinavian work model, it can be assumed that Norway is one of the leading examples when it comes to business ethics. Having followed a Christian and bourgeois way of living, values such as equality and fairness are deeply understood by any Norwegian. If the article published in 1959 concluded that it is time “to commence some form of continues research into business ethics” in Norway, I would conclude stating that to reach the high level of Norwegian ethical values, it is time to commence the implementation of the Scandinavian work model.

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Analysis of Value Creation and Value-Added Analysis Techniques in Published Literature. A Literature Review

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Abstract – The aim of this paper is to review available literature in the field of value-added analysis and value creation. Value added analysis techniques and approaches which are described in the literature are to be presented and systematized. Subsequently a case study is presented and suggestions for process improvement are presented. Aiming to obtain an overview from both the theoretical and practical sides, papers and books from 2006 to 2020 were collected and classified. First according to the genre of the text, secondly, according to the industry meant to be improved, and thirdly, according to the use of single or multiple approaches of value creation. The papers have been grouped into four categories: the first group relates to papers approaching Value Stream Mapping (VSM), the second group contains papers describing and/or using Seven Wastes as value identification technique, the third concerns Process Mapping (PM) approaches and the fourth group concerns a different approach of Nonvalue Added Analysis.

Keywords Value added analysis, value creation, nonvalue elimination, process improvement, manufacturing, value creation in manufacturing

I. INTRODUCTION

Today's rapidly evolving manufacturing processes and technologies are pushing towards reshaping traditional production facilities. Global competitiveness demands high quality products obtained at low cost and with short cycle times. At the same time, there is a constant need to improve both process quality and project delivery time thus, process assessment tools have never been more important.

In the last decades, several value-added analysis techniques and waste elimination tools have been developed and refined by manufacturing experts. Multiple models and guidelines are nowadays used for analysis and optimization of manufacturing processes. Some of these even combine multiple approaches for a proper identification of value adding (VA) respectively nonvalue adding (NVA) activities. On the one hand, computer-based simulations are used to aid conventional tools, but on the other hand psychometric

scales are used to bring human knowledge and experience into the process analysis.

Many past studies have primarily focused on Value Stream Mapping as a method for improving manufacturing activities in various industries, with only a few using methods such as Process Mapping or Nonvalue Added Analysis.

The growing popularity of Lean can be clearly observed during the years as it became a foundation stone for the field of process improvement. As James R. Bradley (2015) describes in the introduction of his book, Lean was first applied in manufacturing and was called Lean Manufacturing [4]. Having the principles applied in multiple domains, Lean Manufacturing is often referred to as simply Lean. Lean grew out of the Toyota Production System (TPS) with the aim to eliminate waste in all areas of an organization thus, shortening lead times, improving quality and reducing cost.

While most papers in this literature review focus only on one or two standard approaches of NVA activities identification, Abdulmalek and Rajgopal (2007) use simulation in order to support the created VSM. They suggest the need of a complementary tool with VSM that can quantify the gains during the early planning and assessment stages [1]. Simulations are further described as a capable tool of generating resource requirements and performance statistics whilst remaining flexible to specific organizational details. Furthermore Wu, Low and Jin (2013) use in their paper a five-point Likert scale to rate NVA activities. Comparing to other studies, in this paper, a field work including all major contractors in Singapore who had experiences in constructing precast concrete projects was conducted aiming to identify NVA activities.

This paper evaluates Lean Manufacturing techniques such as Value Stream Mapping and Seven Wastes, as well as Process Mapping and Nonvalue Added Analysis to propose general improvements of manufacturing processes and further solve the problems presented in the case study. The objective of this work is to gather a collection of papers that use

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various value-added analysis techniques and approaches for the manufacturing sector.

For the literature review, 22 books and papers from 2006 to 2020 were collected. The reason for restricting the research to this period is for an accurate presentation and synthesis of the modern state on the subject. Although, as the topic of process improvement is not a new one, a perspective on this topic is to be discussed as presented by Flanigan (1995). In their book, published in 1995, striving to deliver the best value to the customer for survival in today's marketplace is already regarded as mandatory [8].

In this paper, relevant literature on value added analysis techniques and approaches are reviewed and classified.

First, for a better understanding, a short definition of VA and NVA activities as general terms is presented. Then, according to the genre of the text, various views will be presented followed by a classification of the papers based on the use of single or multiple approaches of value creation. Here, the importance of combining techniques is described and then NVA activities are explained in different industries.

The objective of this work is to present and systematize value added analysis techniques and approaches. Therefore, the four groups are to be analyzed: the first group relates to papers approaching Value Stream Mapping (VSM), the second group contains papers describing and/or using Seven Wastes as value identification technique, the third concerns Process Mapping (PM) approaches and the fourth group concerns a different approach of Nonvalue Added Analysis.

The outline of the paper is as follows: "Research methodology" section presents the research methodology used for selecting the books and papers and it illustrates the searching methodology. "VA and NVA Activities" section defines the two terms from different point of views. "Classification according to the publication genre" section describes the different genres of the selected publications. "Classification based on the use of individual or multiple techniques" section aims to describe the importance of using different techniques. "Classification based on industry" section provides an overview of various VA activities in different industries. "Value added analysis techniques" section presents the four above mentioned groups. Lastly, final remarks and conclusions are delivered.

In this paper, literature relating to the topic of value-added analysis and techniques was thoroughly selected. This topic covers, value creation, nonvalue elimination, waste reduction, value added processes and so on. The selected books and papers were searched for from the Oria search engine which allows searching through the online database accessible to

students of HiMolde University College. Several 23 books and articles published from 1995 to 2020 were selected.

II. RESEARCH METHODOLOGY

The research methodology of this paper is illustrated in Fig. 1. The aim of this taxonomy is to select only publications that focus on value creation in the manufacturing sector and further on value analysis techniques and approaches of manufacturing processes.

Publications concerning for example Economic Value Added (EVA) or VA activities in other sectors are neglected. Theoretical books presenting various value assessment methods were considered important as they describe the fundamentals of the previous mentioned techniques and approaches.

Only papers available on the Oria search engine of the HiMolde University College online database were included in this literature review. The search criteria for the database were: value creation, value added analysis, value creation, value stream mapping, process improvement, process mapping, nonvalue elimination.

Looking for multiple points of views regarding the value-added analysis approaches, any published text genre such as books, articles, thesis, dissertations and other were considered during the search. Moreover, to present an accurate synthesis of the modern state on the subject, papers between 2006 and 2020 were selected.

Taking into consideration the above-mentioned criteria of presenting the modern state of the subject, papers published after the middle of the 2000s were more relevant. Even so, process improvement techniques and value-added analysis approaches are dating back to the middle of the 20th century. Thus, a book published at the end of the century was selected as it is described by its authors as a geared for the person who is looking for a practical guide to process improvement Flanigan (1995) [8].

Based on these conditions, a number of 23 publications varying from books to articles and dissertations, published between 1995 and 2020 were marked as suitable for conducting the literature review. As it will be further described, the selected publications relate to value assessment in various industries.

During the selection process, each publication had to contain one or more of the following criteria: contains value analysis techniques, contains value identification techniques, contains nonvalue elimination techniques, contains process improvement techniques. After passing a final review step, publications were considered as selected for the literature review.

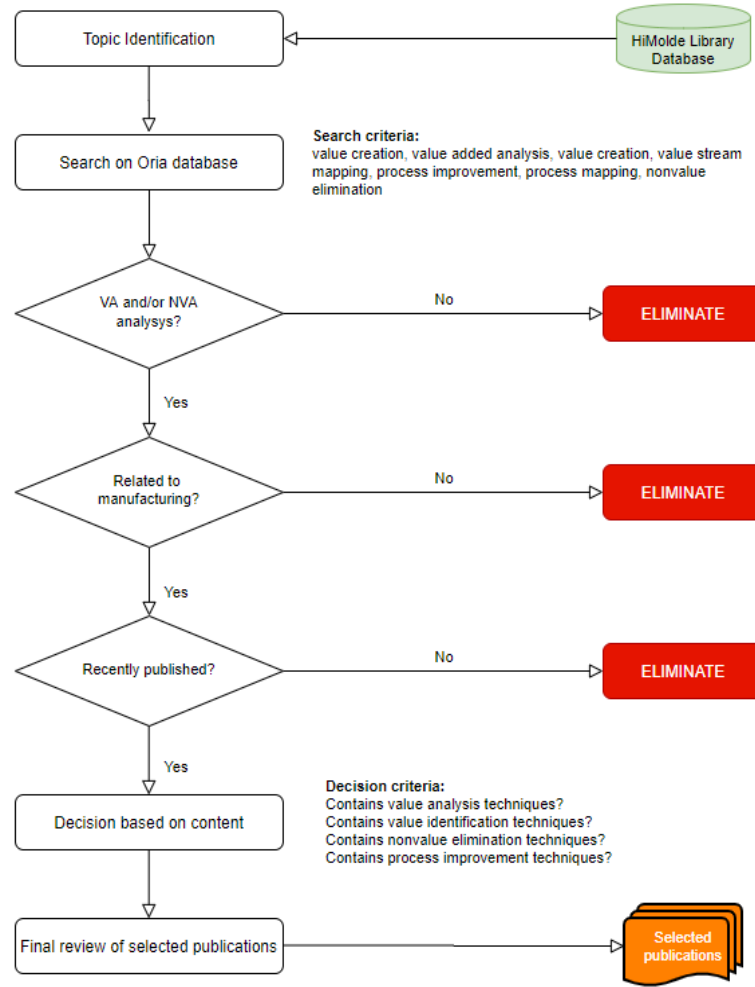


Figure 1 – Research Methodology Schematics

III. VALUE ADDED AND NONVALUE ADDED ACTIVITIES

A. Defining VA and NVA Activities

Ensuring that value is added at each manufacturing activity during the process, is one of the most important things to do order to run a successful production line. The saying, time is money, is still followed by many manufacturing companies but, at the same time, it is crucial to understand which activities add value to our organization and which do not. Analyzing these activities might lead us to the following conclusion: not all the performed activities are essential in sustaining operations, some might even cost us resources and vital time.

In his book, Flanigan (1995) suggest asking a simple question for each input and step within the process: What would happen to the end output that the customer values, if I eliminated this input or step? He further explains if the answer is nothing, then the step adds no value and should be marked as NVA. If the answer is something, then the input should be marked as VA [8].

Carreira (2006) goes a step forward in defining nonvalue adding activities as waste. As defined by one

of the Lean Six Sigma models that we will later discuss, waste is categorized as follow: overproduction, excess inventory, transport, process, rework, waiting and unnecessary motion. The author describes value added as work through which the product is being advanced to a more finished state and the customer is paying for this activity to occur [5]. Thus, nonvalue added activities do not contribute to a more complete product or service and the customer is unwilling to pay for these activities.

On the other hand, in a more recent publication, Bradley (2015) suggests answering to four questions for each process step to determine if a step is a VA step or an NVA step [4]. Opposing to Carreira (2006), Bradley (2015) introduces value-added ratio (VAR) as a relation between VA and NVA. The VAR is presented as being used to compute the percentage of lead time where something productive is being done to the product [4].

A third category of value assessment is introduced by Carreira (2006). Required nonvalue added activity is presented to the readers through two real scenario examples. In case of a manufacturing process where the client requires specific inspection parameters to be performed together with detailed documentation, these activities might be regarded as nonvalue added

activities. However, it is required by the customer, and the customer is paying for this service to be performed, therefore the organization marks this activity as required nonvalue added [5]. Table 1 classifies publications that define or describe VA and NVA activities.

B. Difficulty of Value Creation

Understanding the difference between value added and nonvalue added activities in the manufacturing processes is vital. However, when thinking about manufacturing, industries such as automotive, metallurgical and electronic manufacturing cross our mind. Value creation methods in these domains have been studied by many researchers during the years, thus value creation methods do not represent a burden.

Publications analyzing value creation from a different perspective were added to be reviewed in this work. Son, Lee and Chung (2017) are analyzing and defining value creation of social enterprises in manufacturing industry in Korea while Rajagopal (2014) talks about sustainable value creation in the chemicals industry.

The difficulty of analyzing the performance of social enterprises (SEs) from Korea is presented in a paper published in 2017. The scope of the SEs is very wide, making it hard to evaluate performance uniformly. It is stated that previous researches developed measurement methods that are too specific for some fields and difficult to apply to SEs. The social value creation is an ultimate goal of SEs and according to prior studies, the main difference between for-profit companies and SEs is that the former pursues the maximization of financial performance, while the latter focuses on the social value creation. Crucke and Decramer (2016) also argue that it is not easy to develop general performance analysis models suitable for all types of SEs, because SEs vary on size, industry and purpose [6].

Sustainable value creation seems to be a greater challenge in the fine and specialty chemical industry. Rajagopal (2014) defines this industry as a multiproduct and multilocation one, with a global footprint that is being shaped by diverse mega trends driven by the climate change [14]. Value in the chemical industry will be described in a later chapter. Table 2 lists the publications describing a different approach of value creation.

Table 1 – Publication classification based on VA, NVA description

Topic	Authors
VA and NVA activities	Flanigan (1995), Carreira (2006), Bradley (2015), Valhed and Pavkovic (2017), John X. Wang (2010)
Requested NVA activities	Carreira (2006)

Table 2 - Publication classification based on value creation

Topic	Authors
Value creation in SEs	Son, Lee and Chung (2017), Crucke and Decramer (2016)
Sustainable Value Creation	Rajagopal (2014)

IV. CLASSIFICATION ACCORDING TO THE PUBLICATION GENRE

Looking for multiple points of views regarding the value-added analysis approaches, multiple published text genres such as books, articles and dissertations were included as references to this work. Theoretical books published between 1995 and 2016 presenting various value assessment methods were considered important as they describe the fundamentals of the previous mentioned techniques and approaches.

A. Books

With Lean Manufacturing and Lean Six Sigma as the most popular methodologies when it comes to process improvement, various authors relayed on them to further describe value assessment techniques and approaches in their books. At the same time, Moore (2007) perfectly describes the history and how Toyota Production System (TPS) evolved into Lean Manufacturing. Citing multiple authors in his book, he further states that the inherit limitations after WWII led Toyota to develop techniques to manage its production in a very “lean” environment [13]. At the same time Bradley (2015) states that the primary genesis of TPS was the need to maximize the production of automobiles with the minimum possible resources, contributing to the success of Toyota [4]. Definitions for Lean Manufacturing can be found in multiple books published used as references in this literature review.

Contrary to other authors, Flanigan (1995) does not refer to any of the Lean Manufacturing or Toyota methodologies and relies solely on process mapping to identify NVA and eliminate it. However, his book is an easy, straight forward guide for anyone interested in improving the processes of its organization.

Table 3 lists the books based on the methodology they describe.

B. Articles

With articles being the main source of reviewing value added analysis techniques and approaches, a number of 13 articles have been selected for this paper. The articles refer to case studies in different industries and vary in value assessment techniques. All of these categories are detailed in further chapter of this literature review.

Table 3 - Publication classification based on methodology description

Methodology	Authors
Lean Manufacturing	Wang (2010), Bradley (2015), Carreira (2006), Fredendall (2016), Moore (2007)
TPS	Moore (2007), Bradley (2015)
Other	Flanigan (1995), Rajagopal (2014)

C. Dissertations

Interested to see a perspective from the postgraduate perspective, dissertations are included in this work. Valhed and Pavkovic (2017) refers to a case study at a global grocery supplier and tries to eliminate nonvalue-added activities related to information sharing in the eGrocery order fulfilment process. To answer the purpose of the study, a case study was performed and by using Value Stream Mapping, all activities have been mapped and nonvalue added activities have been identified [18].

On the other hand, Zhan (2016) focuses on Time-based process mapping (TBPM) applied into a practical case. By comparing the difference between traditional process mapping tools and TBPM, his research finds out which kind of company and situation is suitable for TBPM and the reasons why the TBPM is suitable [22].

V. CLASSIFICATION BASED ON THE USE OF INDIVIDUAL OR MULTIPLE TECHNIQUES

Aiming to analyze the approaches and techniques used for value assessment, we are further focusing on the selected articles, leaving the theoretical publications aside for now. Screening through the case studies, two patterns are visible. Authors are either using an individual technique such as Value Stream Mapping and Time-Based Process Mapping or they make use of multiple techniques to identify non value-added activities.

Table 4 - Publication classification based on the use of individual or multiple techniques

Approach	Authors
Individual Techniques	Valhed and Pavkovic (2017), Jasti and Sharma (2014), H. Singh and A. Singh (2013), Moin, Iqbal, Malek and Haque (2020)
Multiple Techniques	Ratlalan, Tama and Sugiono (2017), Raschke and Sen (2013), Abdulmalek and Rajgopal (2007), Anand and Rambabu (2011), Brito, Ramos, Carneiro and Goncalves (2018), Son, Lee and Chung (2017), Bowles and Gardiner (2018), Wu, Low and Jin (2013), Zhan (2016)

Table 4 categorizes the publications based on the use of individual or multiple techniques.

A. Individual Techniques

When it comes to using individual techniques for identifying value added and nonvalue added activities, VSM is mainly preferred. However, previous studies have also used Time-Based Process Mapping (TBPM) as an alternative.

Jasti and Sharma (2014) suggest that the case study approach has been used to show the applicability and importance of VSM in an Indian auto components company and further come to the conclusion that VSM brings out the positive impact on process ratio, TAKT time, process inventory level, line speed, total lead and process time and reduced manpower [19]. In the same manner, H. Singh and A. Singh (2013) address the application of lean manufacturing using VSM concepts in another auto-parts manufacturing organization. The authors concluded that VSM is a very powerful tool to highlight the process inefficiencies and improvement areas [17].

In their article, Valhed and Pavkovic (2017) follow the three steps on how to perform a VSM (according to Paradiso and Cruickshank 2007). First steps consist of identification of the process, aiming to give an understanding of the process and settle the grounds for the value stream mapping. The second step is designing the VSM by Executing a detailed map of the process included all the activities. The third step is called the evaluation step and it is the identification step for nonvalue added activities [18]. By performing a VSM of the unmapped and confusing order fulfilment process towards the company, a reduction of the nonvalue added time within the process has been made [18].

On the other hand, TBPM can also be found in articles as a stand-alone technique. Moin, Iqbal, Malek and Haque (2020) argue that the identification of value-added time through-out the supply chain is a key research area in apparel industries. They made us of activity wise time-based process mappings for thirty contracts help to identify VA and NVA activities [7]. The article is concluded stating that the time-based process mapping is an effective tool to diagnose the process which able the supply chain to take initiatives for better utilization of time [7].

B. Multiple Techniques

Combining multiple techniques in order to achieve a more accurate value assessment has been preferred among the big majority of publications. Simulations and various rating techniques are used to aid VSM and other NVA identification approaches.

Ratlalan, Tama and Sugiono (2017) make use of multiple tools to minimize the waste that occurs in the manufacturing process of military products. The use VSM to describe the overall information from the flow of raw materials to finished products, waste relationship matrix (WRM) for waste identification and analytical hierarch process (AHP) to conduct further

analysis. Using multiple tools helped in a more efficient waste elimination analysis.

Focusing on NVA activities, a comprehensive literature search was conducted, NVAs were categorized and ultimately an NVA analysis has been performed. These steps were followed by Raschke and Sen (2013) during their case study as part of a more complex analysis using Activity Based Mapping.

Meanwhile, Abdulmalek and Rajgopal (2007) use simulation to support the created VSM. To evaluate potential gains based on the implementation of the value assessment tools, a detailed simulation model was developed using System Modeling Corporation's Arena 5 software. They concluded their paper arguing that for managers who might be considering implementing lean manufacturing but are uncertain about the potential outcomes, a detailed simulation model can be used to evaluate basic performance measures and analyze system configurations [1]. The availability of the information provided by the simulation can facilitate and validate the decision to implement lean manufacturing.

In a likely manner, Anand and Rambabu (2011) argue that value stream mapping suffers from various shortcomings and that is the reason why researchers have suggested the use of simulation along with VSM [10]. Similarly, simulations are a tool to provide an idea to the managers of the case organization a real-time perspective of how the organization will be after following lean manufacturing guidelines and how the implementation of these lean manufacturing decisions will affect the performance measures of the organization.

An interesting study combines lean manufacturing tools and ergonomic methods to improve productivity while eliminating the waste that occurs during the production processes and improving working conditions. Brito, Ramos, Carneiro and Goncalves (2018) highlight through a case study in four production areas of a metallurgical industry, the benefits of using an integrated operations management approach to improve productivity and ergonomic aspects. They make use of several ergonomic methods, such as Rapid Upper Limb Assessment (RULA), Strain Index (SI), and Rapid Entire Body Assessment (REBA), to evaluate the ergonomic situation and lean manufacturing tools such as Value Stream Mapping (VSM) and seven wastes to increase productivity.

It is hard to argue if using multiple techniques is better than using an individual one. This decision should be made according to the size and complexity of the organization that needs to eliminate nonvalue adding activities. In the selected articles, both methods seem to be effective. While simulations are used to aid VSM in organizations where the management is not used to lean manufacturing methodologies, in organizations where lean manufacturing is already implemented, using VSM as a stand-alone technique saves both resources and time.

Table 5 - Publication classification based on industry

Industry	Authors
Metallurgical	Brito, Ramos, Carneiro and Goncalves (2018), Abdulmalek and Rajgopal (2007)
Carpentry	Anand and Rambabu (2011)
Equipment Production	Bowles and Gardiner (2018)
Automotive	Jasti and Sharma (2014), H. Singh and A. Singh (2013)
Precast Concrete	Wu, Low and Jin (2013)
IT	Raschke and Sen (2013), Valhed and Pavkovic (2017)
Logistics	Zhan (2016)
Apparel	Moin, Iqbal, Malek and Haque (2020)
Plastic Box Production	Ratlalan, Tama and Sugiono (2017)
Social Enterprises	Son, Lee and Chung (2017)
Chemical	Rajagopal (2014)

VI. CLASSIFICATION BASED ON THE INDUSTRY

Focusing on value added analysis techniques and approaches in the manufacturing field, multiple case studies have been selected. These case studies vary from the metallurgical industry to the automotive, apparel and many others. It is interesting to observe how versatile Lean tools and other value assessment techniques are. As they will be detailed in the following section, these techniques have been used by authors to improve processes in multiple industries. Table 5 categorizes the studies based on the industry.

A. Metallurgical

In the metallurgical industry, Abdulmalek and Rajgopal (2007) apply VSM via simulations to improve the manufacturing process of steel that are used primarily in appliance manufacturing. The focus on one product family, annealed products. By trying to answer a series of structured questions, they come up with an ideal future state map that will further help them in eliminating or reducing different types of nonvalue added activities [1]. Moreover, they use simulations and demonstrate that a detailed simulation model can be used to evaluate basic performance measures and analyze system configurations. On the other hand, in the same industry, Brito, Ramos, Carneiro and Goncalves (2018) focus on reducing nonvalue added activities by focusing on the workers. As previously described, the authors combine several ergonomic methods and lean manufacturing tools to increase productivity. In both case studies a drastic improvement in productivity could be observed.

B. Automotive

Fighting with a high competitiveness, the automotive industry is a major subject in process improvement and waste elimination. Both case studies by Jasti and Sharma (2014), respectively H. Singh and A. Singh (2013) rely on value stream mapping concepts for improvement. Using value stream concepts, current and future states maps of the shop floor scenarios have been discussed to identify sources of waste between the existing state and the proposed state for improving the competitiveness [17;19]. In addition, Jasti and Sharma (2014) further implemented kaizen on the current state map and developed future state map while including these kaizens. They conclude their study arguing that most of the Indian manufacturing organizations or auto-component industries are still not able to implement advanced manufacturing systems [19]. Contrary to this statement, H. Singh and A. Singh (2013) conclude that most of the organizations are very keen to adopt latest techniques, namely VSM [17].

C. IT

The versatility of VSM is also proven by Valhed and Pavkovic (2017), who use this tool in their dissertation to deal with nonvalue added activities in the process within the eGrocery. As an alternative, Raschke and Sen (2013) try a different approach by using activity-based mapping and rate nonvalue added activities to achieve process improvement. They propose a value-based management approach for assessing the potential for process improvements enabled by an information technology solution. In their paper, they address management's need for appropriate methodologies for *ex-ante* evaluations of IT-enabled business process improvement projects. Furthermore, they demonstrate how such pre-assessment methodologies can subsequently enhance the selection of the appropriate IT solution to achieve the desired process improvement [15]. As a result of their study, due to the lack of research and the need for additional theoretical contribution regarding eGrocery Valhed and Pavkovic (2017) have developed a framework. The framework presents how companies in the grocery industry can eliminate the nonvalue added activities related to information sharing in an order fulfilment process within eGrocery [18].

D. Other industries

An interesting approach on value creation in the *chemical industry* is presented by Rajagopal (2014) in his book. Focusing on sustainable value creation, he argues that the fine and specialty chemicals industry, a multiproduct and multilocation industry with a global footprint, is being shaped by diverse mega trends driven by climate change, changing demographics, urbanization, food security and technology convergence [14]. These mega trends impact the industry in vastly different ways and creating value is often a compelling task. Moreover, he states that no specific model exists for enabling sustainable value

creation [14]. Value creation in the chemical industry has several dimensions, each of which is unique to specific regions and companies. The highly complex nature of the industry makes it very difficult to evolve one correct model to create value [14].

In a similar manner, Wu, Low and Jin (2013) focus on identification of nonvalue adding activities in *precast concrete* installation site to achieve a low-carbon installation. Arguing that the difficulty in understanding and quantifying the impacts of the lean principles was perhaps on reason that stakeholders hesitated to use the lean principles to be green and that is why it is only recent since lean philosophy has proven to be effective to meet the challenges of sustainable development [21].

The study conducted by Bowles and Gardiner (2018) proves that process mapping and simulations can be combined to help elimination nonvalue added activities in the *equipment production industry*. The purpose of their work is to study the effectiveness of combining process mapping and system dynamics in an organization to aid process improvement projects [3].

Likewise, Anand and Rambabu (2011) use simulations aiming to present an application of VSM with simulation during the design of lean manufacturing in the *doors and windows manufacturing industry*. Concluding their work, the authors state that there was significant improvement in the productivity, while there was significant reduction in inventory, cycle time, floor space, manpower, etc. [10]. Thus, these simulation models also proved effective for the managers and engineers to see and feel how their manufacturing system will be in the future before the actual design of LMS.

In his research Zhan (2016) focuses on how applying time-based process mapping into the practical case in the *logistic sector* with the major research happening at IKEA's DC terminal in Torsvik Sweden. To fulfill the research purpose, he introduces value stream mapping and time-based process mapping. Overcoming former prejudices for both value stream mapping and time-based process mapping, Zhan concludes that the method of VSM also could be accurate and dynamic though adding the TBPM in the retailing company like IKEA [22]. And meanwhile, the TBPM not only could be applied in isolation for supply chain analysis, but also could be applied in the integrated process [22].

Similarly, in a more recent study, Moin, Iqbal, Malek and Haque (2020), argue that identification of value-added time through-out the supply chain is a key research area in *apparel industries* [7]. Also, by using TBPM, the authors investigated detailed activities of thirty contracts of an apparel supply chain by considering the manufacturer as a coupling point of upstream and downstream.

As described in a previous section, an interesting approach by Son, Lee and Chung (2017) studies value creation mechanisms of social enterprises in the manufacturing industry. The purpose of their study is

to uncover the value creation mechanism of SEs in manufacturing industry. To verify how SEs can effectively create social value and how SEs are sustainable despite focusing on social value creation rather than profit maximization the authors have addressed several research questions [11]. Furthermore, an empirical study on the value creation mechanism of SEs in manufacturing industry and found the role of social entrepreneurship and the effects of product innovation on social value creation and financial performance in SEs. Concluding their work, authors argue that social entrepreneurs can achieve sustainable performance by creating social value through product innovation such as product simplicity, usability and standardization [11].

VII. VALUE ADDED ANALYSIS TECHNIQUES

Analyzing the selected articles, three value added analysis techniques and approaches have been identified. Authors are using value stream mapping, process mapping and nonvalue added analysis as tools for value assessment. These tools are either used as stand-alone tools or combined with simulations, lean manufacturing tools such as seven wastes and Kaizen or even with psychometric scales. Table 6 groups publications according to the technique that was used to identify and eliminate nonvalue added activities.

A. Value Stream Mapping

Clearly being the most popular choice among authors when it comes to value analysis and nonvalue elimination, the versatility of value stream mapping has been proven in the previous chapter where we saw its implementation in numerous industries. Being described in almost all theoretical books chosen for this work, value stream mapping is described in [1] as creating a common basis for the production process, thus facilitating more thoughtful decisions to improve the value stream [1]. Various perspectives about VSM can be found through the articles, authors finding descriptions such as a tool in the concept of lean manufacturing aiming to describe the overall Information from the flow of raw materials to finished products and use their studies to address the importance of VSM in lean manufacturing environment.

Jasti and Sharma (2014) encounter difficulties during their studies and argue in the chapter entitled Limitations, that the top management of the organizations should be involved to implement the tool in that organization successfully [19]. To convince management about the efficiency of lean manufacturing tools, H. Singh and A. Singh (2013) use simulations as a support for VSM. They argue that information provided by the simulation can enable management to compare the expected performance of the lean system relative to that of the existing system it is designed to replace and assuming that this is significantly superior, it provides a convincing basis for the adoption of lean [17].

Table 6 - Publication classification based on the used technique

Technique	Authors
Value Stream Mapping	Valhed and Pavkovic (2017), Brito, Ramos, Carneiro and Goncalves (2018), Anand and Rambabu (2011), Abdulmalek and Rajgopal (2007), Jasti and Sharma (2014), H. Singh and A. Singh (2013), Ratlalan, Tama and Sugiono (2017)
Process Mapping and TBPM	Bowles and Gardiner (2018), Zhan (2016), Moin, Iqbal, Malek and Haque (2020),
NVA analysis using Likert	Wu, Low and Jin (2013), Raschke and Sen (2013)

However, according to Anand and Rambabu (2011) it has been found out that that value stream mapping (VSM) suffers from various shortcomings and suggest that is the reason why simulations must be used alongside with VSM [10]. The authors argue that VSM as a tool is static in nature and can capture only a snapshot view of the shop floor on any day. As proof for their statement, they claim that on a given day, the production might be running smoothly without any problems, while on the other day, there might be various delays due to breakdowns of machines, late delivery by key vendors, quality problems, etc. In these circumstances, thus the VSM tend to vary according to the situations that prevail in the organization [10].

B. Process Mapping and Time-Based Process mapping

In an article published in 2018, the quality magazine highlights in simple terms, the difference between process flowcharts and process maps stating that a flowchart is a diagramming tool while a process map, or process mapping, refers to the procedure of creating a diagram. In their book, Flanagan (1995) state that a process map is a handy tool to gain a better understanding of your process and that it is especially useful when complicated processes are to be examined [8].

Similarly, to VSM, the work of Bowles and Gardiner (2018) proves that process mapping and simulations can be combined in order to help elimination nonvalue added activities. During their study, a project team used system dynamics to supplement improvement insights gained from process mapping. The authors conclude the paper by stating that their study supplements insights gained by previous case studies into the effectiveness of combining process mapping and simulation when conducting business process improvement efforts [3].

On the other hand, Zhan (2016) focuses on Time-based process mapping (TBPM) applied into a practical case. One of the research objectives of his work is to compare the traditional process-based

mapping tools and Time-based process mapping. Citing various authors, Zhan states that in contrast to the traditional process mapping that being a simple metric, time allows a rich understanding of the symptoms of poor performance and is effective in identifying and diagnosing waste [22]. In a similar manner Moin, Iqbal, Malek and Haque (2020) use TBPM to identify value-added time through-out the supply chain in apparel industries.

In his dissertation, Zhan (2016) describes the advantage of TBPM as being an easy-to-use tool as time is simple measure that everyone understands, even allowing people who have little training, to measure the performance of a process or activity. He further states that if the measures are simple to understand, it will be easier for people to figure out the big issues. Concluding, people they can directly measure the process of activities and target a process which is just adding time [22].

C. NVA analysis using the Likert Scale

Only a few publications were found to implement various lean manufacturing tools or other value assessment tools together with a Likert scale to identify nonvalue added activities.

In their paper, Wu, Low and Jin (2013) use a five-point Likert scale to rate NVA activities. Their study adopts a weighted factor model comprising 30 contractors in the Singapore construction industry and a case study. Comparing to other studies, the authors conducted, a field work including all major contractors who had experiences in constructing precast concrete projects aiming to identify and most importantly rate nonvalue added activities.

The results indicated that there are many non-value adding activities in the site layout management practices that contribute to an increase in the carbon emissions level. Similarly, a five-point Likert scale is used to identify the potential impact of the functional requirement on reducing the NVA activities in the case study conducted by Raschke and Sen (2013) [15].

VIII. CONCLUSIONS

This literature review has presented and systematized value-added analysis techniques and approaches. A total number 23 publications were selected and used during the analysis of this topic. Considering the importance of the value creation in the manufacturing process, the number of published articles on this topic is not substantial.

By far the most popular choice among authors when it comes to value assessment and nonvalue elimination is the value stream mapping tool. Recent publications have proven the importance of using simulations alongside with the VSM to both create an accurate research when it comes to variation in processes from one day to another and to allow a better understanding of the efficiency of lean manufacturing implementation in an organization.

To conclude, choosing the right value assessment technique or approach should be a result of a decision made according to the type, size, complexity and Lean experience of the organization.

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The Management of Smart and Sustainable Urban Projects. A View into the Caransebes Public Administration Project Challenges

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Abstract – This paper aims to review the management of smart and sustainable urban projects, to generally analyze public administration and the Caransebes municipality project challenges. An effective public administration requires an intensive integration of all strategic documents available to provide a systematic and coherent approach for establishing, attaining, monitoring, and updating the public administration strategic objectives in the most instructive manner [9]. To manage the city resources efficiently, it also requires an Integrator to unite in a strong partnership the citizens, the business environment, the organizations, sharing the same common vision.

Keywords: environmentally friendly, mobility, public administration, smart city, sustainable urban development

I. INTRODUCTION

Project management has never been proven as complex as nowadays. Processes have been added, concepts have been explained and new techniques have been included so as to help projects managers to go through the increased complexity of a documented, well written project [8]. But what were considered in the past as purely theoretical concepts, now is a certainty, what were considered in the past glimpses of science, now emerged into ‘the smart communities’. These communities are defined by the Canadian Federal Government (CFG) (2002) as “those communities in which local leaders and stakeholders, by use of electronic networks and the Internet, are forming alliances and partnerships in order to innovate and extract new economic and social value” [10]. Wherever the local innovation systems, largely supported by digital networks and their applications, were contributing to the diffusion of knowledge and information, knowledgeable decision making, network cooperation, efficient interaction among various actors and intelligence gathering, the concept of smart cities emerged. But what is a smart city, and what is a smart

city within urban development? Cities have existed as a version of urban form since the beginnings of civilization and are constantly being shaped through technology and cultural trends [2].

More people certainly live in the cities as time can determine, and that is because the urban area offers more than ever: diversity, technology, efficient services, transportation, utilities, water networks, information systems, hospitals, libraries, schools, different types of electronic models it also offers to their community's interactions with the city officials, as it evolves by integrating itself information and communication technology (ICT), operations and service to connect people, enhancing quality, performance and interactivity of urban services.

This urban area uses electronic methods, devices, sensors, to collect data, dates that are then used to manage goods services, resources efficiently.

Every smart city has its own potential: a favorable geographical position, rich culture, good economy, but what is sure now, is that every city now tends to shape itself into a “smart-city” and that is because a smart city will always and totally support and integrate the Community and Municipality and the other way around.

A common vision (municipality and community) will develop every component of the Smart City: information and communication technologies to enhance quality, performance and interactivity of urban services, reducing costs and consumption, power plants, recycling waste, transport ticketing, smart parking, intelligent street lighting, physical devices connected to Internet of things (*IoT*) network, transportation system and traffic management, administrative services which allows the city officials to interact directly and find out the citizen needs, the city infrastructure, monitoring what is happening in the city 24/7, green energy sustainable urban development and education.

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Figure 1. Synergies of a smart city
(Adapted from <https://smartcity.brussels/the-project-definition#>, Accessed June 10, 2021) [11]

The World Commission on Environment and Development defines Sustainable Development as “Development that seeks to meet the needs of the present without compromising the ability of future generations to meet their own needs” [1]. The principle behind this definition is the well-known fact that natural resources must not be consumed beyond their capacity to regenerate.

Many of today's dominant social, economic and environmental challenges are the result of rapid economic growth that exceeds our capacity for analysis and control. For this reason, it is necessary to identify ways to explore and co-create solutions that exploit the potential of innovation at the local level.

Each mayor makes it a priority for the construction and implementation of a smart city, from a public administration perspective. It is one of the biggest challenges because it is targeting the future. Our world is constantly changing, and we are facing pressing and undeniable facts: environmental degradation and climate change, the digital revolution, the demographic transition, migration and social inequalities.

Cities often lead the way in finding solutions. Their importance in ensuring the transition to a way of a life sustainable development for all citizens is the Urban Community's Agenda. Thus, the strategic documents of the city become the solutions to complex challenges. But it is not enough. At least not without strong and comprehensive partnerships between citizens, civil society, industry and relevant levels of governance.

Cities are essential in bridging the gap between people and public institutions. New forms of governance to improve the policymaking and investment process are already in place introduced in many cities, by encouraging cooperation between urban and rural areas on the basis addressing functional areas, through long-term strategic planning or involvement citizens at all stages of policy making.

This requires a strategic, integrated and inclusive approach [6]. To understand what needs to be done, the city must be understood from the standpoint of its five dimensions:

- Technique;
- Economic;
- Social;
- Environmental;
- Jurisdictional.

As well, as a social and technical system. A dynamic system in which people or groups of people interacting with technology. All these concepts of defining the structural elements of a city, form a unitary whole, by the fact that all systems interact with each other. For instance, the economy affects infrastructure, infrastructure affects life (social, political - economy). Traditionally, cities have two main layers: the infrastructure layer and the service layer.

Smart cities combine the best aspects of infrastructure technology with collaborative technologies, allowing citizens to take control of themselves through digital technology [6].

For the period 2021-2027, the European Commission proposes an urban and territorial stronger dimension, by introducing a new policy objective, namely “*A Europe closer of citizens*”, to support an approach based on the reality of the territory and involvement local authorities, civil society and citizens in addressing local challenges. Additionally, the Commission proposes to launch a new European urban development initiative, which will support cities through capacity building, innovative solutions, knowledge, development policies and communication. The funds allocated for sustainable urban development have also increased to 6% of the total European Regional Development Fund [5].

But it's sort of the culmination of efforts if we were to think about it in the late nineties when the European Union focused on urban development. Regular meetings between ministers responsible for urban development have led to the consolidation of an “EU perspective” on the urban oasis (the “urban oasis”), which can be translated into a development approach sustainable urban development at EU level.

This approach has been refined over the years within the framework of EU cohesion policy and other initiatives with a specific focus on the urban dimension.

A new programming period (2007-2014), and sustainable urban development policies have been fully integrated into funding schemes of the EU following the positive evaluation of URBAN initiatives; in other words, they became part of “central” cohesion policy.

II. RESEARCH METHODOLOGY

The research methodology of this paper is based on the information structured in Fig. 2. and Fig. 3. The aim of this paper is to select publications that focus on the urban development.

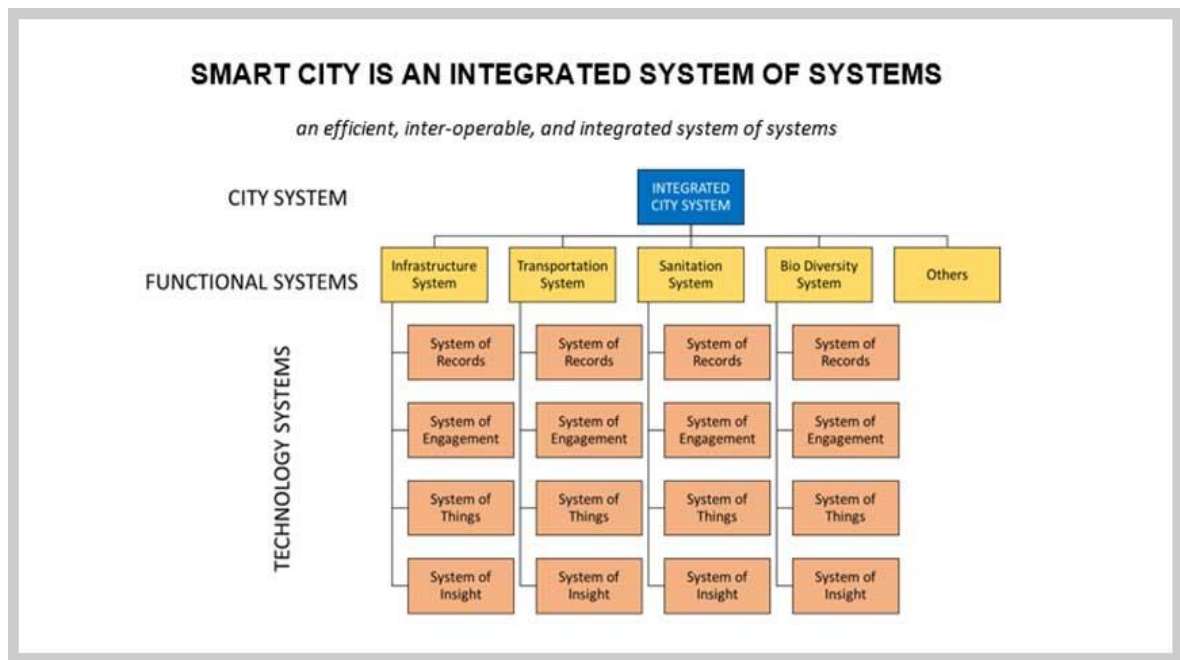


Figure 2. Integrated city system
 (Adapted from <http://www.businessworld.in/article/Smart-City-Is-A-Complex-System-Of-Systems/28-04-2019-169768/>,
 accessed, June 10, 2021) [12]

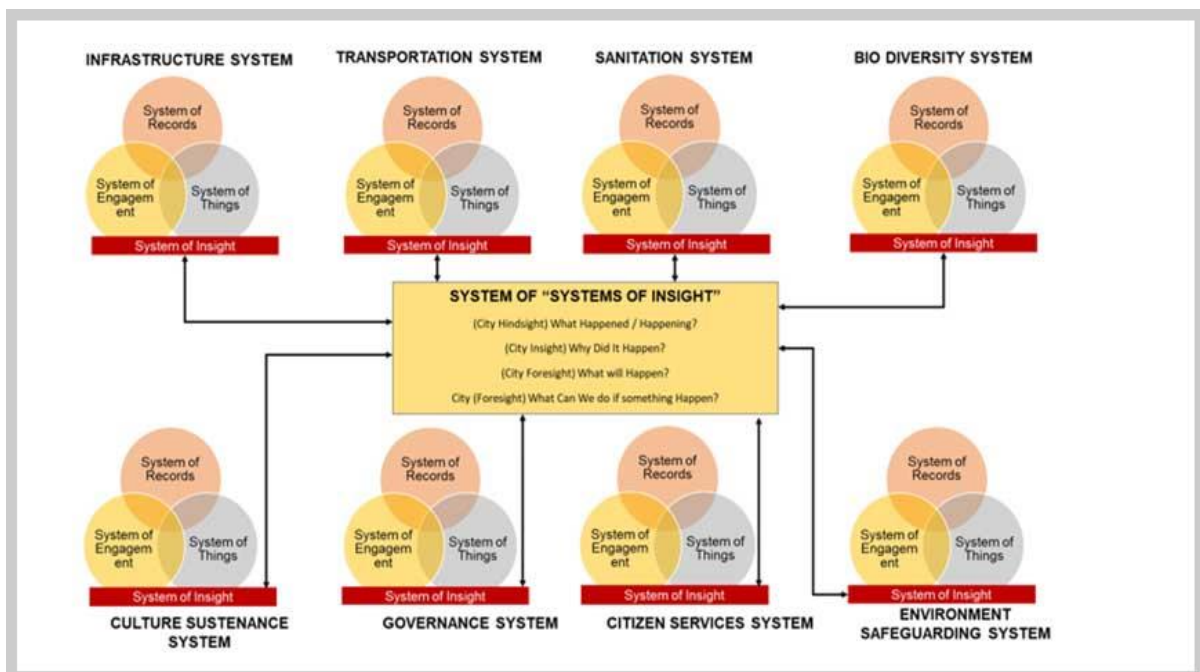


Figure 3. System of “SYSTEMS OF INSIGHT”
 (Adapted from <http://www.businessworld.in/article/Smart-City-Is-A-Complex-System-Of-Systems/28-04-2019-169768/>,
 accessed, June 10, 2021) [12]

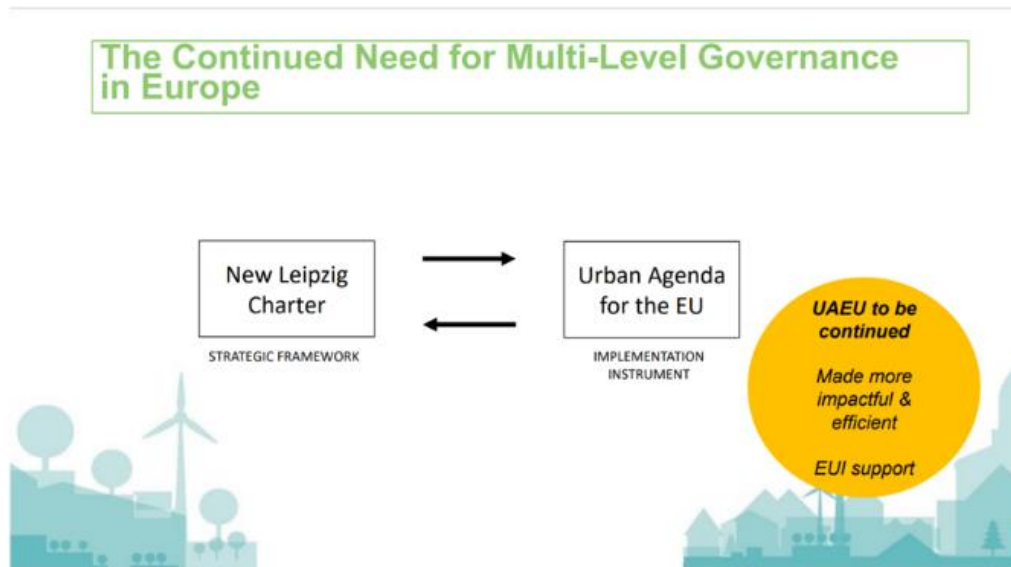


Figure. 4. The Leipzig New Charter
(Adapted from <https://ec.europa.eu/futurium/sites/futurium/files>, accessed, June 10, 2021) [13]

Publications concerning EU's cohesion policy and under the other initiatives specifically oriented towards the urban dimension, were considered important. For example: 2007 was a defining year in this process. During the German Presidency of the Council of the European Union, The Leipzig Charter was launched. Leipzig Charter offers two key principles for sustainable urban development: implementing a policy of holistic, integrated development and a particular focus on disadvantaged communities [1].

2007 also marked the beginning of a new programming period (2007-2014) and sustainable urban development policies have been fully integrated into funding schemes of the EU following the positive evaluation of urban initiatives; in other words, they became part of "central" cohesion policy.

The EU Urban Agenda was another important document, in 2016. Based on the Leipzig Charter (fig.4), the Urban Agenda emphasizes the importance of an integrated approach to urban development, which have the following characteristics

- Goes beyond the sphere of sectoral policy;
- Must be supported by cooperation between different levels and stakeholders;
- Exceeds administrative limits;
- Targets cities of all sizes.

III. SUPPORTING A COMPETITIVE ECONOMY, ENTREPRENEURSHIP AND INNOVATION THROUGH PROJECTS FOR CARANSEBES MUNICIPALITY

The future of smart city lies under supporting the high value-added economy, innovation and entrepreneurship, so as all the citizens live in a healthy habitat, an energy-efficient green urban environment accessible and safe. The need for investments in the city's business infrastructure must be considered. It

could support the development of competitive economic activities, but also the need to support entrepreneurs from various economic sectors (creative industries, agriculture).

In this view, project names proposals as:

- Arranging industrial parks;
- Creating an industrial platform in the airport area and attracting investors from the aeronautical sector;
- Establishing an association to promote local initiatives at micro-regional level;
- Providing facilities to entrepreneurs in the creative service sector;
- Center for the collection and distribution of agricultural products and simulating the development of short supply chains;
- Creation of structures/networks for promoting traditional products from Caransebes and its area of influence;
- Creation of a commercial consultancy center, in order to facilitate the connection between local producers and potential buyers;
- Development of an efficient transport system and utilities, accessible and sustainable, well connected to national traffic infrastructures.

For the smart development of Caransebes municipality, the development of an efficient transport and utility system, accessible and sustainable, well connected to the national traffic infrastructures is a major desideratum.

The expansion, rehabilitation and modernization of transport infrastructures is and must be supported by specific priority projects due to the imperatives related to increasing urban mobility and encouraging alternative transport systems (bicycle lanes, pedestrian arteries, public transport ecological means of transport).

The commissioning of the airport (first phase of charter plane) will play an important role in connecting the city to the national and international transport flows, also.

At the same time, the densification of utility networks, especially the deficient neighborhoods in this regard, is based on a series of projects aimed at expanding the sewerage network, water and gas supply, modernization of the field of household waters.

The energy efficiency of buildings, as well as the creating of modern waste collection systems and increasing their recycling is another set of priority projects.

Modernization of the public transport system to increase the urban mobility by the rehabilitating the sidewalks, the streets of local importance, logistic plans or regulations for the traffic, will definitely lead to an integrated sustainable urban mobility system: arrangement of bicycle lanes, modernization and optimization of public transport and the related infrastructure; purchasing of environmentally friendly means of transport and establishing of new routes and extensions of the existing public transport routes to the city's tourist objectives.

Making efficient connections and increasing accessibility in the peri-urban area of Caransebes municipality will be achieved by purchasing electric buses/minibuses and arrangement of stations for public transport in the peri-urban area through developing a traffic monitoring system.

Increasing the population's access to utility networks, modernization of the city's technical infrastructure is a must by modernization and extension of the public lighting system, by extension, of all the natural gas distribution system, of all the water supply network in the peri-urban area and sewerage network. An underground relocation of overhead cables and those located in historic buildings and energy efficiency of the public buildings.

The population is expected to grow, many challenges will be faced, and open questions will be raised to about what the future of cities can bring. Cities are expected to cover greater areas than in the past and have to optimize how the public spaces will be designated and used. The adaptation of infrastructure and service will shape differently and will increasingly use new technologies and innovation in a wide range of sectors. From transport and mobility in housing, ensuring inclusiveness and integration among communities, reducing environmental impacts.

The tools at hand to resolve the future challenges lies in educations. Ensuring a solid and the involved social-cultural environment, based on quality and performance in education, health and culture. In order to establish the priority of the projects in the education field, there is a stringent need to ensure the appropriate educational environment from the perspective of security, building sanitation, and later, the necessary directions to ensure the desired level of human resources of learning outputs.

Citizen's engagement in policy processes is growing and should become more prevalent in the future [12]. The involvement of stakeholders, political commitment and strategy development within the city is the key to the smart, durable management of the city.

Promoting quality habitat in green, energy-efficient, accessible and safe urban environment must be made by integral rehabilitation/energy efficiency of the buildings in the private property of Caransebes City Hall, urban remodeling of public markets, arranging natural parks with relaxation facilities, adequate furniture and playgrounds for children.

Improving the quality of environmental factors is aimed by several projects, some with potential of immediate implementation, other do not require a more complex approach, being achievable in the medium term. They address to pressing community issues, such as waste water treatment, air quality and direct impact on human health. Urban health advantages are not to be taken for granted. An integrated approach for a healthy community can be only possible by taking the necessary measures as: modernization of water treatment plant, purchasing of environmentally friendly means of transport, increasing the area indicator of green space, improving the ecological status of surface water quality monitoring systems and pollutants, increasing the number of quality monitoring points for discharged water, for air quality monitoring points, extending the air quality assessment parameters, decontamination and ecological rehabilitation of former industrial areas, use of alternative energy sources from renewable sources or use of ecological practices in the management of green spaces.

A healthy city is an extremely dynamic system that needs improvement and monitoring, and good urban governance is mandatory.

Increasing administrative capacity and optimizing the relationship with the social-economic environment starts from the premise that the efficient functioning of the local public administration is essential for increasing the quality of life of citizens.

As a result, priority is given to projects with inter-sectorial training effect, which increase administrative capacity by improving the internal performance of the mayor's office and related public services, respectively, by improving the interaction with citizens and social-economic efficient management of public funds, increase the openness and receptivity of the administration to innovative solutions and respond to the needs of local authorities, in line with general trends of smart sustainable development.

The hierarchical projects are grouped on three basic dimensions of the administrative activity: increasing the competence and performance of local administration; improving the relationship with citizens and the social-economic environment; strengthening inter-territorial collaboration.

Prioritization the administrative need through strengthening a high-performing team with digital skills and strategic vision for writing projects and

attracting funds for a socio-economic development, encourage participatory governance, training programs for the employees to prevent conflicts of interest and combat corruptions, joining inter-territorial associations and concluding collaboration agreements on areas of mutual interest.

V. CONCLUSIONS

Citizen engagement in policy processes is growing and, in the future, will become prevalent. New forms of governance are already being stimulated and the increase of the importance of city network is expected [10]. The future of urban and smart project management is not set in stone or predictable, but every step, and every decision that is made, will shape the future of a smart and green city. The good use of urban space will relieve many of the pressure put on a city, including reducing environmental impacts, improving social services, social cohesion and proper housing, and efficient mobility which will greatly impact on the city overall liability.

The integration of technology must be adopted in such a way that help benefit as many people as possible, cities will transform into more technological and innovative, more connected using high resolution data for a better management of urban system.

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STEM Education and the Water Management. An Entrepreneurship Initiative

Nicoleta MIREA¹, Constantin Florin BOGDEA², Irina OROIAN³

Abstract – The aim of the paper is to establish the current state of a new STEM (Science – Technology – Engineering - Mathematics) learning method concerning entrepreneurship towards different ages of students by evaluating the situation of water sustainability. Based on the findings of the study, the new and the old one, we could be able to develop a motivational program taking into consideration all the key findings and suggest policies and initiatives that could empower and enhance them to keep clean water. The analysis will be fundamental to develop entrepreneurial competences taking into consideration exchange of good practices project also.

Keywords: Science, Technology, Engineering, Mathematics, STEM, Entrepreneurship, Water, Sustainability

I. INTRODUCTION

In the article published online entitled “*Water - One of the greatest challenges of the 21st century*”, under the aegis of the global company “RAMBOLL - Bright ideas. Sustainable change”, Danish author Søren Hvilshøj, Global Market Director at Water Rambøll Danmark, states the following: “One of the biggest global challenges, now and in the future, is water. Torrential rains are more frequent due to climate change, causing sewage to overflow, but at the same time, water shortages in other areas threaten public health and reduce food production. By 2050, the world's population will have grown from 7 to 9 billion. This huge increase means that the need for water will increase by more than 50 percent, if we continue to consume at the current rate.

In the report “*An Environmental Outlook for 2050*” published in 2012, the OECD (Organization for Economic Co-operation and Development) estimates that around 1.5 billion people live today in areas severely affected by water scarcity. According to the report, the number will increase to almost 4 billion by 2050, which will trigger a global food crisis if the current approach is not changed. He said: “*The biggest global challenge is the lack of water, because it affects*

food and energy production. Climate change, water pollution and huge waste of water are also crucial issues that need to be addressed”.

An excerpt from a United Nations report exemplifies this common refrain: The existing 263 transboundary lake and river basins cover nearly one half of the Earth's land surface and account for an estimated 60 per cent of global freshwater flow. A total of 145 States include territory within such basins, and 30 countries lie entirely within them (Thomas, 2017).

By exploring the implications of the ontological turn for water governance debates, however, we contribute most directly to a growing body of literature that is reformulating our understanding of the nature of water and human – water relations (Yates et al., 2017).

Water pollution is a problem for all of humanity. Everything is right when you open yourself to the possibilities, perception is the key in the business: Why keep the water clean? Because when polluted waters are modified biological, chemical, or physical, making them unsuitable or dangerous to the health, aquatic life, industry, tourism, or industrial fishing.

Sustainability is a word we throw around a lot, but study of entrepreneurial education helped me see that you, as an individual, must understand who you are to know how you fit into your community, or how you can make a better world. You must face who you are before can give best. And you must understand who others are and what makes them special. Because real sustainability is not going to be about any of the things that any company involved into this process already bring to the table, but about perspective, motivation, and resources. It is going to be about figuring out what part we all can play in the future, the part that fits us best, and then fitting ourselves into the wider world, making it our mission to keep those connections – our relationships – with each other and the land – the planet – strong.

About STEM pedagogy: the wonderful universe of science, technology, engineering, and mathematics brings in this pedagogy the examples from the

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surrounding reality that link them together, so that with their help, scientific discoveries will motivate us to invent new things that will make our lives easier and protect nature, at the same time. In this respect, the paper will take into consideration a couple examples (experiences or/and experiments) concerning environment protection and water protection as the source of life.

About STEM history: „In the 1990s, the National Science Foundation (NSF) began using “SMET” as shorthand for “science, mathematics, engineering, and technology.” When an NSF program officer complained that “SMET” sounded too much like “smut,” the “STEM” acronym was born. As recently as 2003, relatively few knew what it meant. Many that year asked if the STEM Education graduate program I was beginning to envision had something to do with stem cell research. That was still very much the case in Fall 2005, when the Technology Education Program faculty at Virginia Tech launched STEM Education graduate program.

But when Americans learned the world was flat (Friedman, 2005), they quickly grew to believe China and India were on course to bypass America in the global economy by outSTEMming. Funding began to flow toward all things STEM, and STEMmania set in.

Now, nearly everyone seems somewhat familiar with the STEM acronym. And yet, it remains a source of ambiguity. Technology educators proudly lay claim to the T and E in STEM. But so, too, do Career and Technical educators, who seem to have claimed the “E” as their own. Most, even those in education, say “STEM” when they should be saying “STEM education,” overlooking that STEM without education is a reference to the fields in which scientists, engineers, and mathematicians toil.

Science, mathematics, and technology teachers are STEM educators working in STEM education. It is an important distinction. In addition, there is the common misconception that the “T” (for technology) means computing, thereby distorting the intended meaning of the STEM acronym. Suffice it to say, STEM is often an ambiguous acronym, even to those who employ it.” (Sanders, 2020).

STEM was born from the desire to emulate how life operates by merging four core disciplines: science, technology, engineering, and math. In the real world, these disciplines often work together seamlessly, and with little fanfare.

But if we want to prepare children to be future scientists, we need to inform them about the past. By doing so, we demystify scientific advancements by revealing their messy historical reality; we show students how science is conducted; and we could spotlight scientists who have been written out of history - and thus invite more students into the world of science (Ramirez, 2020).

II. FIRST EXPERIMENT: CROSSROADS IN LIFE

„There were always going to be crossroads in life...”, this was the beginning of my 2018 Entrepreneurial Skills course within the Project entitled: A chance for marginalized communities in Caransebes Municipality - code 2014+: 101559, project co-financed by the European Social Fund, Human Capital Operational Program 2014-2020, POCU/18/4/4.1 “Integrated local development (DLI 360 degrees) in marginalized communities where there is a population belonging to the Roma minority - Less developed regions”, because those involved in the project trying to change their lives, through a new professional entrepreneurship approach.

The first and one of the important topics of discussion was Environmental Management and Sustainable Development, and the part related to water usage and water pollution were intensely debated.

Interesting for the actors participating in the debates (aged between 25 and 55) was the STEM linked to History approach of the subject, starting from the following images, about an early and most-essential water wheel machine, named Noria (Machinery Lubrication, Noria corporation, 2008):

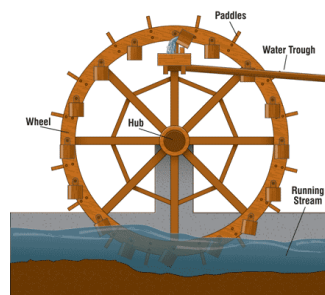


Figure 1. Parts of the Noria water wheel machine

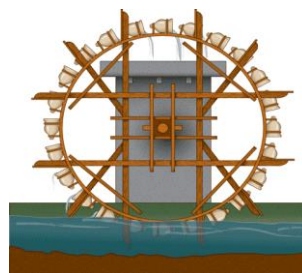


Figure 2: Persian Noria Using a Wheel of Pots for Raising Water

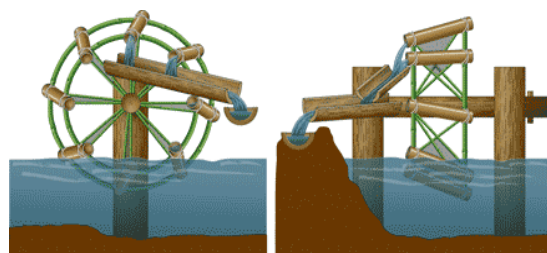


Figure 3. Example of the Chinese Noria

Figure 1 and Figure 2 represent parts of “noria” (comes from the Arabic term, Na-urah) meaning “the first water machine”. It was the earliest mechanical device propelled by means other than man or animal. The noria was an inevitable invention that sparked the development of countless types of hydraulic and rotating machines. Over the centuries, it has allowed civilizations to nourish their villages and crops with water, the most fundamental of resources. In time, this triggered the beginning of a new era - the turning of arid lands into prosperous empires. (Machinery Lubrication, Noria corporation, 2008)

Figure 3 speaking about some possible evidence of water wheels in early China, but they were likely derivations of the western norias. Because the Chinese had developed geared machinery from an early age, it is likely that they powered these mechanical devices using water wheels and norias that were originally advanced in the West during the Hellenistic Age (Machinery Lubrication, Noria corporation, 2008).

The water protection subject has been intensely debated starting from these three images. At the end of the last class, the following results are important: the unanimous conclusion to elaboration and design of a possible new project, having the following main objectives:

- To know, to identify and to promote the importance of keeping clean water to those involved through research activities, partnerships with environmental institutions and experimental activities;
- To identify environmental problems related to water resources through exchange of information with all the actors involved;
- To identify the possible improvement solutions for environmental problems concerning water use and water quality through study visits, research activities, workgroups;
- To develop civic attitudes concerning the protection of nature and life, concerning ecological problems including through scientific and artistic activities to improve water wastage;
- To develop civic skills on environmental issues.

III. SECOND EXPERIMENT: THE GATEWAY TO SUCCESS

The second experiment focused on 12th grade students (aged between 17 and 19 years old), from a technological high school with an environmental protection profile.

The right words can be the gateway to success, even though money does speak volumes in a language everybody can understand. But giving to the students a few choice words had made all the world of difference, deserved by the best representation money could buy.

So, in this experiment, the right words were sustainability, water usage and water protection.

While STEM skills are themselves increasingly important in our technologically rich world, STEM is also a pathway to engage students as critical thinkers, and even as future citizens. By placing science in the broader context of history and culture, we can remind students of how scientific inventions play a role in our evolving cultural and even moral belief systems. And by giving students the space to critique inventions, we give them the skills to shape the future (Ramirez, 2020).



Figure 4. Rudaria water mill.



Figure 5. Inside the Rudaria water mill.



Figure 6. Mill from Rudaria after the floods.



Figure 7. Other mill from Rudaria after the floods.

Geographically, the second experiment took place in our natal county, although the 22 water mills from Rudaria (Figure 4 and Figure 5) are in Caras-Severin County and included in the UNESCO world heritage. The water mills from Rudaria, unique in Eastern Europe, suffered terribly from the floods of September 2014, 21 of them being severely affected (example, Figure 6 and Figure 7, photos by Radio Romania Resita).

Historically, today, as a hundred of years ago, at Rudaria in Banat, the locals prepare their corn and wheat flour at the water mills with sieves, mills older than the village and with which everyone found themselves. The complex has a special ethnological and anthropological value, a first-rate historical and architectural value, each mill within it being a monument of architecture, of popular civilization.

As a teacher I understand now: When history is included in STEM, students learn science, but they also learn about the much broader impact of science (Ramirez, 2020).

So, from history to present day: There are still 22 mills on the water, which still grind the "corn" grains but also the time, as the locals like to submit. In the interwar period, there were 48 mills in Rudaria. Some are over 400 years old others are placed there on the hearths of mills used by the Dacians and later by the Romans.

The housing constructions of the mills are made of wood, covered with shingles, and the installations have the same technical, constructive, and functional principle - the water turbine. It is said that the Land of the Mills in Banat was founded by the Dacians.

The 22 mills are held in disrepair, a kind of fellowship just like sheep lathes and pastures. Each mill is associated with between 15 and 25 owners, each with his own row or rows. A big row means a day and a night - a small row - just a day or a night. Nobody pays anything, and the old and huge key is held by the "head of the mill" (Popovici, 2019, InfoCS.ro),

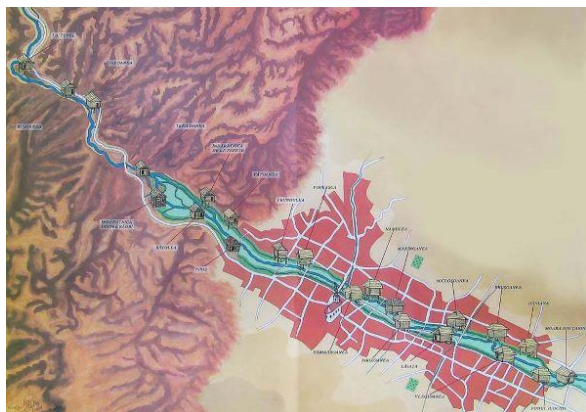


Figure 8. Rudaria water mills map

This second experiment lead to these questions: *What kind of society will we be in the future? What happens if the "noria" was never invented?* And students result after a couple of hours debates concluded: The overall objective of this STEM

approach was to develop skills that will lead to the attitudes and abilities of a creative, reflective, cognitive, social interaction and communication, to promote cooperation in order to shape an active entrepreneurial education in order to protection of nature and life by improving the environmental problem, in particular the one connected to the water.

By placing science and technology in the broader context of history and culture, we can remind students of how scientific inventions play a role in our evolving cultural and even moral belief systems. And by giving students the space to critique inventions, we give them the skills to shape the future (Ramirez, 2020).

So, the path to success of this second experiment has been travelled both geographically and historically and has led to a better understanding of an ancient technology, which has survived to the present day. The path to success (from ancient times – to the present day - to the future) is the open door (gateway) through creativity, imagination, and innovation to become successful future entrepreneurs.

IV. CONCLUSION

The two experiments led to the elaboration of an extracurricular project, with possible non-reimbursable financing, considering the following:

a) Integrated approach: Through the project, the results and experience gained will be integrated into the environment protection education strategy and high school PAS (SAP – School Action Plan) for 2020-2023.

b) Transferability to other people/students in difficulty who wish to move from the status of a person in possible school dropout to the status of a person who has passed the maturity examination. This objective will be achieved through the possibility of participating in a wide range of educational programs offered, including on environmental protection by keeping clean water.

c) It is intended that after the project is completed, the experience gained will be transferred to multiply the effects of the project, to reduce school dropout and absenteeism, including with the help of the local community.

d) The established working team will also be the promoter of the pupils in difficulty, being a platform for the project's sustainability through active involvement and social responsibility.

After the experiments other students' conclusion were:

1. Humans make mistakes. They are only unforgivable if you don't do anything to make right.
2. Not everybody is cut out to be an entrepreneur. For that you need qualities and competencies.
3. Anyone can appreciate an objective look, another perspective on things.
4. The road to success is strewn with many obstacles.

5. Sustainability must consider both the needs of the people and the resources of the land.
6. The tension between needs and resources must not lead to any kind of war.
7. The unlimited character of human needs, desires and necessities will remain unchanged, as well as the limited character of the earth's resources.
8. STEM pedagogy includes real-world examples and experiments that will help us connect these four areas of life around us.

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