



Cluster Management Excellence NEK, Bratislava, Slovak Republic

***INTERNATIONAL INVITATION AND ITINERARY OF
CONSULTATION AND PRESENTATION WORKSHOP***

**Designing innovative tools for energy
and environmental cluster habitats**

Prague , Czech republik

March 2020

Organized with the financial support of the Ministry of Economy of Slovak republic within the grant program to increase the competitiveness of members of industrial cluster organizations

3 x E: ENERGY, ECOLOGY, ECONOMY

MAIN PRESENTATION CIRCUITS OF SELECTED CLUSTER MEMBERS

The content and objectives of the international workshop fully meet the Innovation Strategy for the Knowledge Economy (ISBN 9781136395284, Debra M. Amidon: Taylor & Francis Group in Information Business) and the project is directly and permanently set up and composed to engage in EU activities to the EU Permanent International Program: Knowledge Innovation Community and other related programs under the European Initiative (cit: European Institute of Innovation & Technology (https://eit.europa.eu/eit-community-at-a-glance/slide_2782) long-term intention to create a knowledge and innovation community in the field of energy and environmental in Slovakia.

The program was adopted at the international conference: "Youth & Entrepreneurship - Drivers of Innovation" as defined by the rules on 19-21.10.2011 in Krakow.

The applicant's cluster project contributes to clustering in Slovakia, innovation and smart specialization, as the individual activities and the participants themselves are directly involved in the project's value chains and thus support the implementation of regional innovation strategies and interregional and national and international cooperation between clusters and business networks; all activities defined in the project, and building a new cluster habitat is a key priority.

The project also includes the participation of the applicant as an independent expert for the SR in the EU program: „Standing Committee on Technological Research“.

The agenda of this workshop is part of a special analytical, educational, presentation and promotional project with an international focus **“Designing innovative tools of energy and environmental cluster habitats”** for energy and ecological innovations in project creation and designed as a comprehensive knowledge thematically focused on future users – workshop attendance - workshops to support the increasing competitiveness and innovative creativity of industrial cluster members and partners by streamlining their collaboration by implementing project results into industrial business practice. Details are given in the Project Description of the application.

The goal of the project is to create a knowledge base and a portfolio of solutions for energy and environmental clustering strategies and maps and the implementation of educational curricula and related workshops through research and analysis, and to contribute significantly to the growth of the project participants' personal self-awareness creation of innovative industrial investment projects, technologies, buildings and engineering approval activities.

The goal is to support the creation and strengthening of activities in underdeveloped regions by constituting new regional and local clusters in the industry concerned.

The purpose of constituting a portfolio of knowledge and strategies through studies and workshops and conferences is to organize a cluster-based education not only for its own membership, employees and functionaries of the cluster organization, but also for potential participants, new industrial clusters and partners, specialized state administration and self-government, which is the greatest added value and long-term benefit of the project for real industrial development in Slovakia.

The significance of the project lies in the intensification of information and knowledge transfer and related expert activities and presentations of the applicant - industrial cluster and its ability to participate in international projects and networks in the near future to significantly support the innovation and creativity of cluster members and partners in the sphere of industrial cluster and its competitiveness and strengthening its dominant position in the industry.

The organizer of the workshop is the recipient of **the Award of the Minister of Economy of the Slovak Republic** for the Innovative Act of 2012 for the creation and implementation of the Modern Organizational Module for cooperation and project management of ecology and energy projects.

The applicant was actively involved in the **National Entrepreneurial Prize for the Environment of the Slovak Republic** where it was awarded Honorable mention in 2013.

Cluster Management Excellence NEK has implemented several successful educational projects for almost 850 people, in 2014, 2015, 2017 and 2018 with the support of the Ministry of Economy of the Slovak Republic, based on investment and project assignments of important foreign investors. It is a long-term organizer of the top international event - the ENERGOFUTURA conference (already 10th anniversary in 2019) included in EU cooperation projects and belonging to the portfolio of the 5 most important energy-related events for professional public in Europe.

The importance of this event is also underlined by the fact that it is regularly held under the auspices of the Minister of Economy of the Slovak Republic personally and is attended by other important domestic and European politicians.

The key activities, programs and internal projects of the cluster are focused on reducing energy intensity in industry, removing ecological and environmental burdens, promoting renewable energy sources, long-term and professionally set up specialized training for investors, entrepreneurs, industrial designers, scientific researchers of technical universities and employees of specialized state administration and self-government in the permitting construction proceedings and all over the country in Slovakia with excellent results.

The current projects of the applicant started and developed since 2013, continuously supplemented and specified, especially:

- O Innovative modules for industrial investment management.*
- O Research of methodology and application of renewable sources in SMEs.*
- O Creation of application mixes for removal of bio invasive loads of water sources.*

All these programs are financed exclusively from the own resources of the cluster members and on the basis of social demand, without any EU and Slovak grants.

The cluster has been organizing competitions and advice for cities and municipalities for four years to improve and update the Energy Local Concepts according to the latest EU parameters and requirements and has been working with the SIEA on this topic.

Cluster is a long-term direct professional partner of the Slovak Chamber of Civil Engineers, the Association of Construction Entrepreneurs of Slovakia and industrial clusters in a related segment of operations in the Czech Republic, Hungary, Poland, Austria and Slovenia, and in Italy, Serbia and Lithuania.

The applicant shall itself support environmental education and development of the environment through its **own programs and projects** for the industrial and business spheres, including:

02-12-ENE/2012-007 Supporting renewable

03-12-INO/2012-001 Industrial innovation and creativity

04-13-ŽIP/2013-001 Reclamation and elimination of environmental burdens

The applicant has an experienced professional team, has more than 50 important and economically strong members from industry, local governments, technical universities and professional organizations and associations.

Workshops are always primarily intended for members, officers and employees of a cluster organization; they are in fact small and medium-sized enterprises, investors and operators, designers of industrial, ecological and energy constructions, as well as employees of members, especially in the fields of construction investment and designing of industrial energy and environmental departments.

The level of acquired knowledge is defined as an adequate self-understanding of basic and derived theoretical and application knowledge, perception of the human social status in the environment and simultaneous training of the development of the participants' own abilities and skills.

It is a need for qualitative personal presenting of the needs, expectations and activities of participants - members, officials and employees of the cluster organization in real, future and especially sustainable social, personal and environmental environment.

Key factor is **the formation of one's own progressive attitudes, the growth of environmental awareness and the promotion of participants' own creativity**, as well as a change in attitudes towards the design and investment of industrial projects with a priority view of environmental protection and care

The workshop is organized by an organizational team directly from the Center of Enviro - Energy Education of the organizer in Kosice, where study materials are prepared, organizes service for lecturers and completes teaching aids, literature and promotional materials for participants in cooperation with project service suppliers.

The lecturing and consulting team is conceived as a group of experts from the applicant's membership base - technical universities, research and development institutions, practice, state administration and self-government as well as trainers of companies implementing significant environmental projects focused on industry, energy, construction, multifunctional buildings and complexes.

ORGANIZATION AND SCHEDULE OF FOREIGN WORKSHOP PRESENTATION

Working day 1 - 2	1. day:	2. day:	
Section 1	Hours: 10		
	Introduction section, information about the current state and starting points of clustering, individual programs and support mechanisms of participating countries		
Section 2		Hours: 4	
		Lecture section, definition of common interests, strategy and coordination of cross-border clustering	
Section 3			Hours: 6
			Introduction of cluster members, consultation of joint partnerships and V4 projects within industrial cluster networks, designing joint V4 programs

CONTENT OF PRESENTATION OF FOREIGN WORKSHOP

<p><i>Introduction section 1</i></p>	<p>First working day:</p> <p>Registration and opening 8⁰⁰- 9⁰⁰</p> <p>Introduction Duration: 8⁰⁰- 12⁰⁰</p> <p>Content of section 1: Organizational information, presentation of the applicant's activities and program, its scope and results, the purpose of the workshop, proposal of cooperation with foreign partners. Achievements of industrial clustering in Slovakia and their comparison with foreign environment. Discussion</p>
<p><i>Lecture section 2</i></p>	<p>Group of presentations about the activity and strategy of industrial clustering among V4 cross-border partners</p> <p>Duration: 12⁰⁰- 14⁰⁰</p> <p>Coffee Break: 13⁰⁰- 13³⁰</p> <p>Continue: 13³⁰- 18³⁰</p> <p>Content of section 2: <i>Group of presentations on the following topics: Creation of a common expert base and design of technological tools of activity, sphere of interest and market position of industrial clusters production in the field of energy, investment activity and environment with emphasis on innovative cluster habitats. Networking of information databases and cooperation in participation in selected European projects. Methodology of addressing and unifying industrial energy cluster projects in potential cooperating countries: Hungary, Czech Republic, Poland, Bulgaria, Croatia, Great Britain, Italy, Serbia, Lithuania and Germany.</i></p> <p><i>Designing and creating innovation in industrial investments for sustainability, energy and economic efficiency and reducing environmental burdens. Project, legislative and social constraints at home and abroad. Discussion.</i></p>
<p><i>Lecture section 3</i></p> <p><i>Consultation section</i></p>	<p>Second working day:</p> <p>Introduction of selected cluster members,</p> <p>Consultation and discussion</p> <p>Duration: 08⁰⁰- 12⁰⁰</p> <p>Coffee break: 12⁰⁰- 13⁰⁰</p> <p>Content of section 3: <i>Presentation of the results and achievements of some important members of the cluster in the field of energy and environmental industry and construction, associated with the exhibition of information banners and selected cluster products to stimulate cooperation with a foreign partner. Discussion of expert document conclusions. Consultation and discussion of partners.</i></p> <p>Duration: 13⁰⁰- 16⁰⁰</p>
<p><i>Accompanying action</i></p>	<p><i>Exhibition of banners and promotional information materials on projects and activities of the applicant's members</i></p>

COMBINATORY OF INNOVATION AND INTERBLINING OF THE DEPARTMENTS, DEVELOPMENT OF DIGITAL DISRUPTION

Digital disruption - is a modern and distinctive term in economic, management and social practice, the meaning comes from - word: digital (digital, analogue to digital, etc.) and word: disruption (tearing, breaking, breaking, breaking)). In translating the meaning into the investigation of the management processes of specific entities - clusters, this modern concept should be understood as the application of the management approach in the form of accurate decomposition and description of all management, monitoring and evaluation processes and their turning into exact mathematical, geometric or logical categories with measurable and controllable data and parameters, and consequently the development of generally applicable models of behaviour and creativity of research, governance and business organizations with a view to increasing efficiency and innovation capacity.

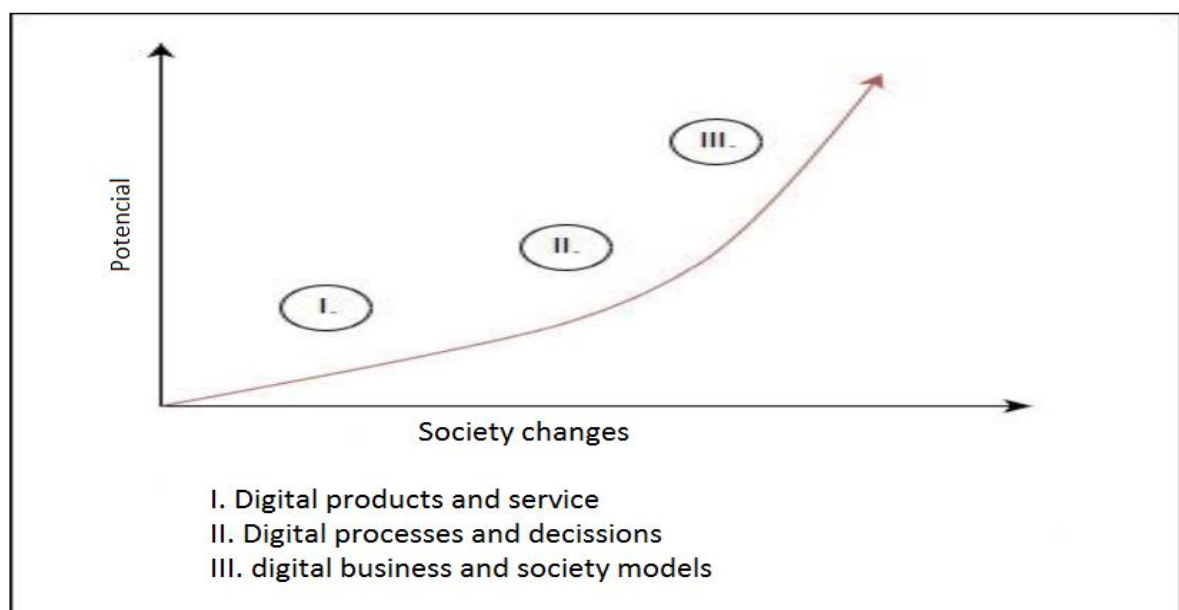
The tool of digital disruption is digital transformation, and it is true of P. Schumpeter that “disruption is a creative destruction” where something new, better, different arises at the expense of the old, destroyed.

The main goal of research and analysis of the term digital disruption is to determine changes in management, strategic and especially innovative processes in organizations. The idea is that today everything that can be digitized at a given stage of development in all sectors of human activity and competence.

Thus, processes and decisions, products and services, and especially business and management models, are digitized. The picture shows the levels of digitization as perceived by scientists in the world today, and this is an exponentially increasing dependence of potential changes on changes in society.

Due to the particular position of cluster organizations in the markets, the research will also be focused on the ten most significant changes in the disruption of social and business events by combining 10 factors: digitization, mobilization, screening, disintermediation, transformation, intelligence, automation, virtualization, anticipation and robotization.

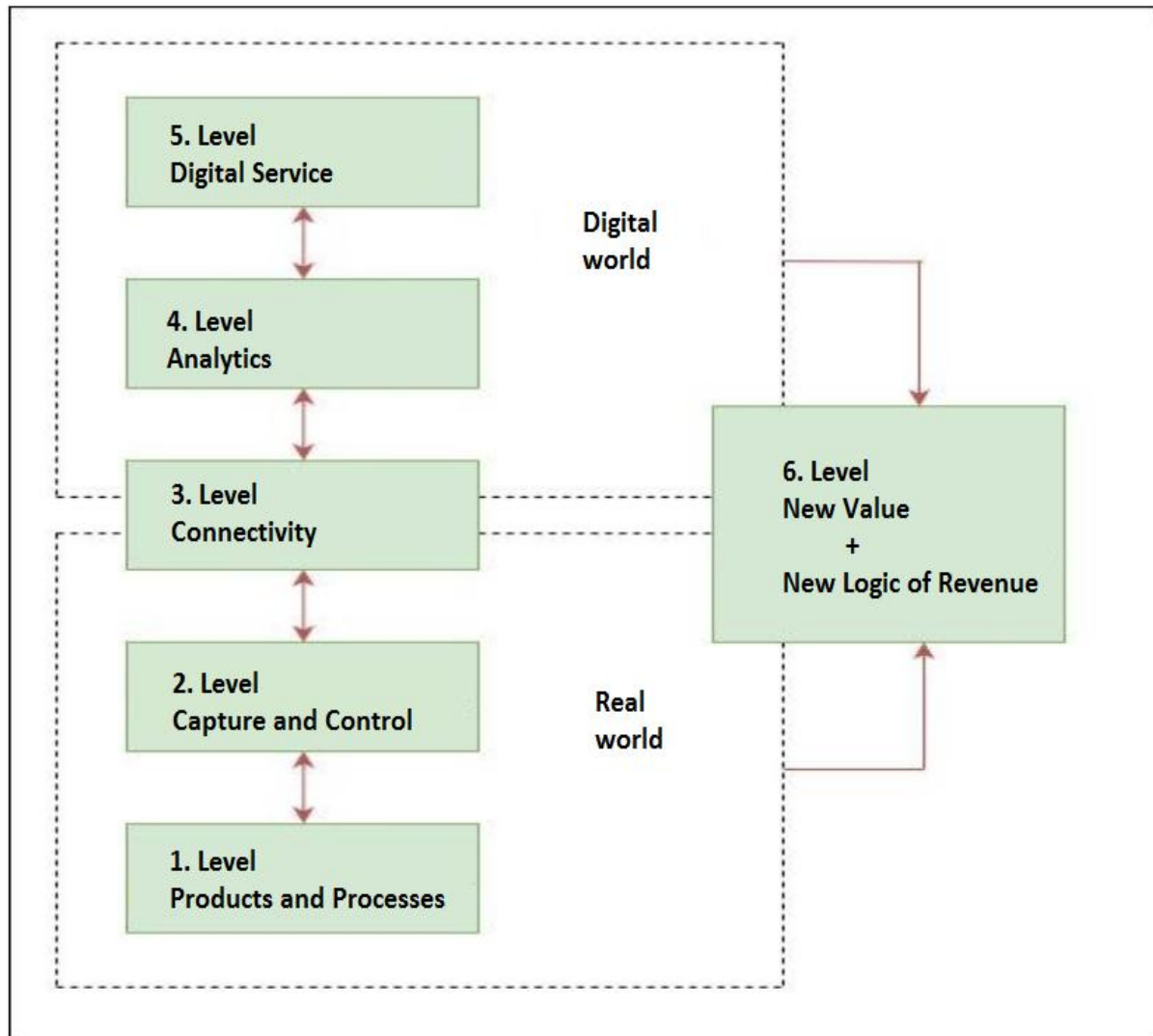
Figure: Levels of society digitalization



Based on digital disruption, it is possible to create new values for the future up to six levels, where initially the creation of added value on some physical thing or process, followed by the introduction of intelligent management interventions and corrections, then communication systems equipped with appropriate connectivity thus, a new level of complex analytics is emerging, with implications for service management.

Consequently, the level of digital services arises, connected with significant reductions in the unproductive service costs of processes and services and finally new social and business models are created ed. **form of full service of customers and business partners**. The diagram is shown in the following figure.

Figure: Sequence of levels of digital transformation of added value



For the purpose of establishing cluster networks and combinatorics of cluster processes and services for society and its own membership, it is necessary to understand the rules of designing digital business models, which have its own laws and these are:

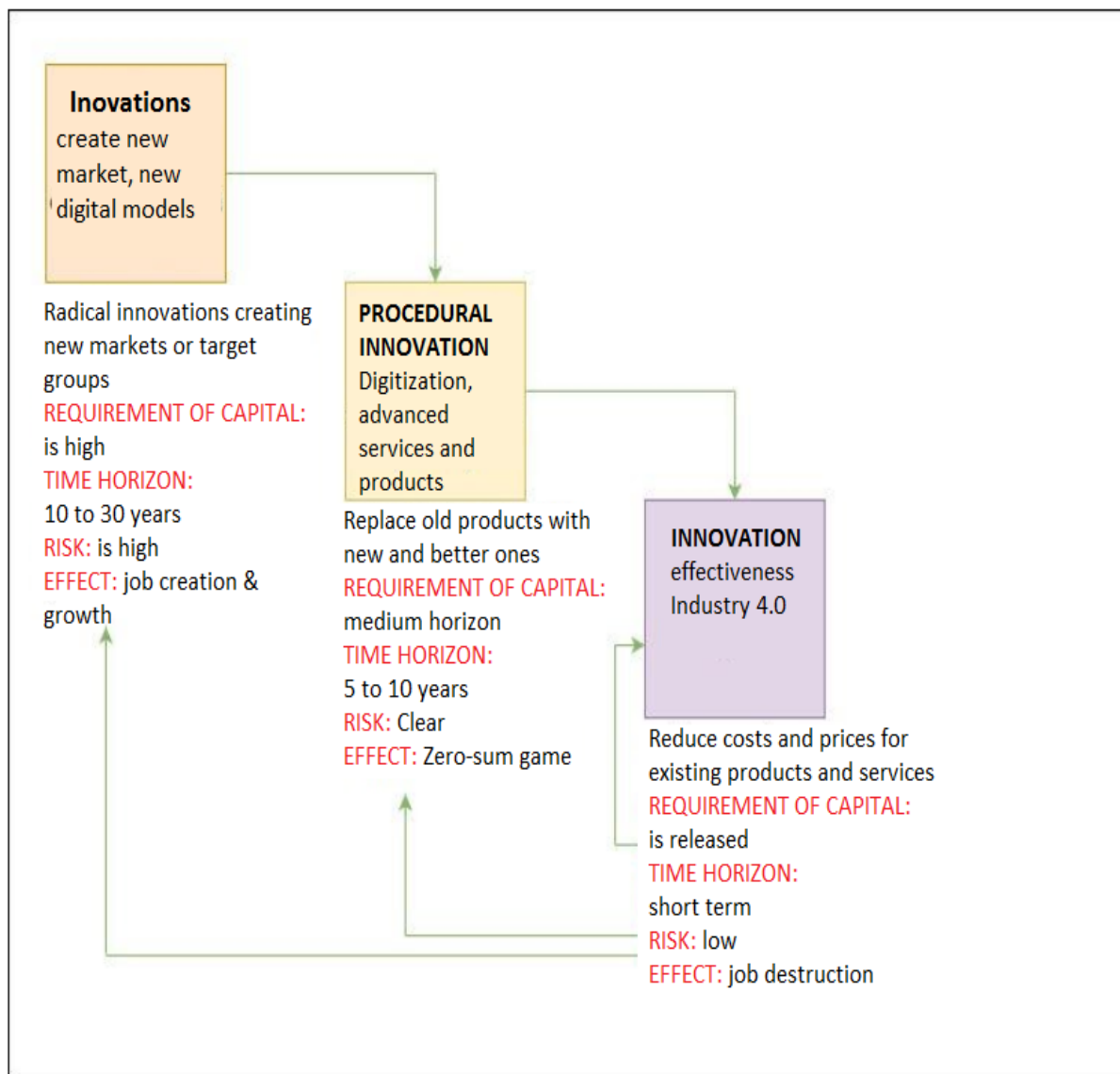
1. Exponential development
2. Combinatorics of innovation and removal of barriers between industries

3. Creating monopolies by networking effects
4. Zero boundary costs and the creation of a fluid economy without financial overheads
5. Minimizing transaction costs and revolutionizing the product economy
6. Access to material, human, knowledge and technical resources prior the ownership
7. Personalization, decentralization and regionalization of the creative and innovative offensive to the researched entities.

During the fulfilling and realizing the research task, the team of authors also dealt with the distinction of three basic logical approaches of clusters to innovations, which are connected in various ways to the growth and development of the organization. Their correlations and connections are illustrated in the following figure:

1. Innovations that generate new demand creates a new market, new clients and new opportunities for organizations, while placing them in a leading, even leadership position.
2. Evolutionary innovations where cluster products and processes replace and enhance an existing portfolio and maintain the competitiveness and position of cluster members in the relevant market.
3. Efficiency innovations that are based on the need to reduce resources during production and eliminate job opportunities to streamline processes.

Figure: Scheme of innovation and growth connectivity



The question for setting innovative cluster practices for the future is: why established companies and business associations around the world today fail regularly in the so-called technological development using professional marketing and management. Clayton Christensen in The Innovator's Dilemma claims that organizations fail because they do everything in principle, develop products and processes, track their clients' needs and expectations, but ignore accompanying solutions that do not suit their clients at the time and spend resources on serving satisfied clients, in which the subconscious, however, literally doze new requirements, but the company cannot meet in time.

The downturn is precisely the effort of business and manufacturing organizations to deliver current and especially profitable products, but not to observe possible future constellations of the evolution of customer demands.

AND THIS IS A PROBLEM NOWADAYS

The following table clearly illustrates the comparison of the differences between disruptive and evolutionary innovations.

Table: Comparing the differences between disruptive and evolutionary innovations

	DISRUPTIVE INNOVATIONS	EVOLUTIONARY INNOVATIONS
Product Technology	The newly formulated main performance attributes are initially weaker New prized advantages with location in renowned markets	Innovation and improvement of key performance attributes
Market Client	New marginally defined market	Mainstream relevant market and focus on key and financially stable clients
Risk	High level of failure and unknown application options	Low client demands and well-defined market and competition in the segment
Business model	New with the need to identify individual processes and competences	Basic known competencies are reflected in the development of the existing business model
Revenue and growth	Uncertainty and long-term low effect	Good and stable results with predictability
Service providers	Newly created entities	Established organizations in the business segment

It is necessary to define and verify in practice the basic premise of setting up an organization for digital transformation at management level in the following core activities:

1. Developing a well-tuned awareness - questions: how much added value does digital technology provide, how is it beneficial to differentiate client needs, how to improve value logic, what new customer segments can be reconstituted, how input improves due to digitization to the market and whether this will increase the revenue.
2. Thinking in the sphere of business logic - assessment of topics such as target group and product placement on the market, the logic of the supply itself and logic of value and yield creation.

3. Opening of strategically important processes in clusters - reflection on the creation of a real and common acceptable image of the cluster's competences and its management, opening the approach to generating special innovative ideas radically into the environment, positive filtering of all valuable parameters for future use, networking and qualification of inventions ideas to succeed.
4. Accelerating and prioritizing the implementation of innovative processes and knowledge - introducing creative design into the design of organizational structures of business groups and designing lean start-ups based on testing work hypotheses and designing minimalist parameterized and functionalist products
5. Systemic collaboration of cluster organizations with start-ups in a given segment, but also related production fields - includes support and animation of agile partnerships and processes, access to new ideas and new products.
6. Continuous monitoring, evaluating and restoring the behaviour and understanding of organizational problems and states - creating cognitive management and diversity models, creating the independence of innovative decisions from current organizational commitments, applying decentralized knowledge databases and collecting them in an efficient, thematic way.

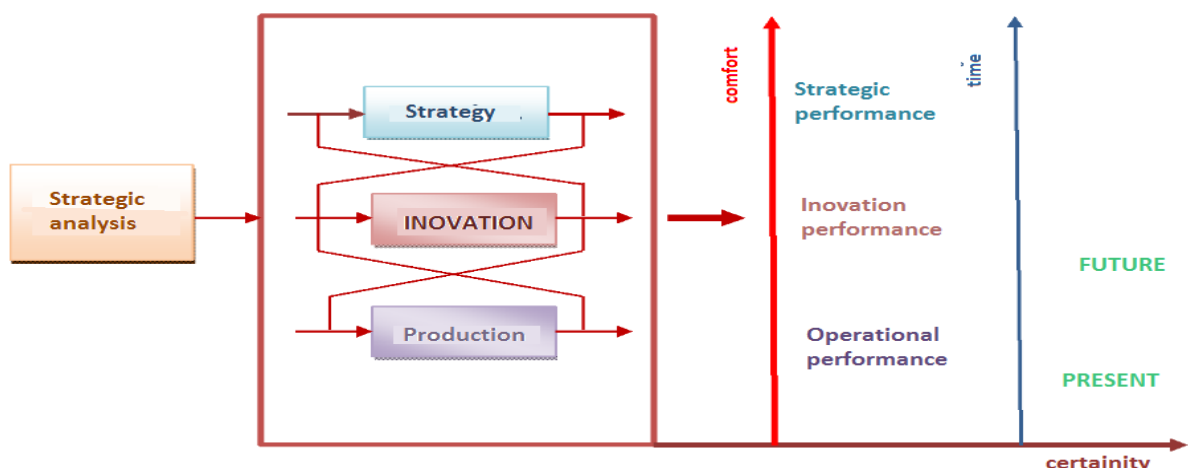
DESIGN ALGORITHM OF IMPLEMENTATION OF SELECTED CLUSTER PARAMETERS

In order to solve all other proposals and formulate the most important parameters, it was necessary in the research work first to establish an algorithm for solving and verifying the actual procedure for finding and defining the parameters so that their value corresponds as faithfully as possible in the segment of SMEs, but also leading leaders in general.

The figure shows the applied custom designed authoring algorithm according to the approach described in the next part of this work.

Subsequently, the proposed overview is elaborated in this subchapter and the idea of solvers of this work about parameters no. 1 to 7, including a description of the capabilities and activities that are proposed to be clearly fulfilled in the cluster organization under review in the future to ensure the growth of innovation capacity and the quality of production and services.

Figure: Design of algorithm for implementation of selected parameters of investigated subject



Sensitivity to the environment is crucial and must be the norm in the daily management program. A distinctive force must be the individuality of the products, which protects against concentration and pressure on prices.

Table: Proposed parameters for implementations

List of necessary parameters, capabilities and activities that the cluster must permanently implement and achieve for the continuous high performance of the innovation process.	
Parameter no.1	<i>Ability to identify and propose an opportunity</i>
	The faster we discover the opportunity, the more we operate and draw less resources than our competitors. However, we need to create a real business plan, minimize risks and ensure a return on resources.
Parameter no.2	<i>Ability to realize opportunity and get rid of risks</i>
	We need to draw ideas into realization, achieve innovation compatibility with the existing system. Techniques for market flexible response, partnership and customer interaction must be applied.
Parameter no.3	<i>Ability to finance cluster innovation</i>
	We need to create resources to test, test new programs, projects and procedures with customers, and be able to fund the promotion of the obtained or intended results.
Parameter no.4	<i>Ability to learn and cooperate</i>
	It is necessary to continually increase the qualifications and attestation of the team with new licenses, exams and to continuously evaluate the knowledge gained to the level of new projects at the customers. At the same time, the management has to look for external partnerships (know-how, finance, personnel) outside the cluster and locations.
Parameter no.5	<i>Ability to work with people</i>
	In addition to managing staff, motivating and evaluating outcomes, we need to seek out talent and greatly support creativity and brainstorming, as well as create a stabilizing base and present personal outcomes.
Parameter no.6	<i>Ability of strategic dynamics and flexibility</i>
	We need to create a reserve and capacity for innovation in the strategy, a kind of pool of ideas and implement them at the right time. In doing so, we continuously monitor the market and other competitors and respond immediately to the news.
Parameter no.7	<i>Ability to design the future and shape the market.</i>
	We have to generate projects, constantly improvise and mobilize relationships and flexibly manage work teams. It is actually strategic architecture, not planning. Well-founded estimates bring success and shape the future market in the area for our benefit.

RESEARCH OF ENERGY, ECOLOGY AND INNOVATION

Energy is a vast, cross-cutting activity across all spheres of human activity that affects long-term production, other industries, as well as social life and has serious long-term environmental impacts. The most serious challenge today is to find environmentally clean, energy-efficient solutions that, on the one hand, ensure:

- (a) Sustainability of energy*
- (b) Economic efficiency and stability of supply*
- (c) Meeting the growth in energy demand*
- (d) The portability and storage of supplies*

and at the same time ensure:

- (a) a clean environment*
- (b) Reducing existing burdens from the previous period*
- (c) Accessibility for the various developed regions*
- (d) Compatibility with other interconnected human activities.*

There are many preferred energy topics such as EU and Slovak energy policy, Renewables and their development by 2020, Environmental and energy context and impacts of a modern product company, Energy audits, Integrated design for energy quality improvement, Design and construction of promising energy with high efficiency.

However, the most important thing is to promote innovation and competitiveness in industry and energy, while reducing the environmental burden on our blue planet.

The problem with the times is that the energy business often outperforms all logical arguments for optimizing the environment and negatively affects all reasonable development trends and projects.

Therefore, it is very important to explicitly set future investors and implementers of construction and industrial investments to internally believe that thinking ecologically means thinking for the future and for your own survival.

In terms of **environmentalism, ecology and the environment**, it should be noted that this is an overlapping synergistic and inseparable terminus of technology, and in today's modern world it is one of the decisive key problems of human functioning, development and survival. It is not the purpose of this publication to analyse directly the content of these terms and the whole broad topic, as there are dozens and hundreds of well-founded sources of information.

Today, it is not possible to innovate, create, design, score and invest without the presence and literally identification, living and feeling of environmental perception and access to the environment.

Energy, environmental sciences or ecology are therefore concepts whose mutual coexistence is vital and which require infinitely great capabilities for managing problems, solutions and

projects, without the current state of development would not be able to manage energy security, but especially environmental protection.

Therefore, innovation is a way of approach without future development and new investment and works are not conceivable.

IMPLEMENTATION OF INNOVATION PROJECTS AND INDUSTRY PRODUCTS, SUSTAINABILITY

Since the 1970s, there have been extensive discussions around the world on the development of industry and modern technologies in the context of growth limits, global warming, planetary climate change, threats to the depletion of mineral resources and energy availability, and so on.

Various catastrophic scenarios have arisen and everything has been attributed to development, research and growth as a result of innovation, while innovation is also helping to eliminate many of the major societal impacts on the environment and resources.

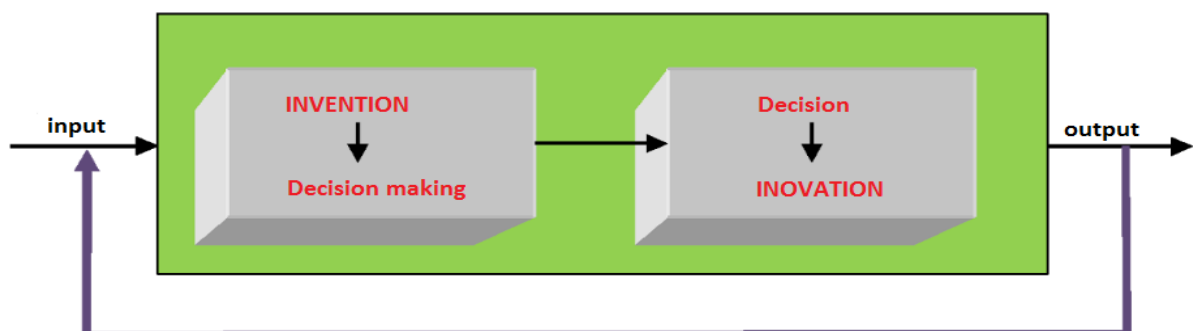
The biggest and most acute problem of the time and specifically in the conditions of clusters and companies and their project management is to set criteria and limits of long-term (multiannual) sustainability, i.e. the ability of introduced and applied innovation in the project to be economically and operationally effective in the long term. impact on the environment and customer resources.

CREATIVITY AND INNOVATIVITY IN CLUSTER ORGANIZATIONS

From the point of view of the chosen approach to the research of creativity and innovation, the work applies mainly to the so - called. psychometric and cognitive experimental approach, where the focus is first on the scope of creation, i.e. the performance of the management and project team in tasks containing specific aspects of creativity, assuming that these are measurable and evaluable quantities (exact or verbal) and that can apply testing that quantifies and qualifies the intuition and appearance and active knowledge of the object. This takes into account the size, sociographical, personal, technical and technological prerequisites and the specificities of the subjects selected from the SME business, which are important members of today's clusters on a pan-European scale.

The basic algorithm (Figure in the text) is to illustrate connections between invention and related decision making on the one hand and the continuity of decision making and innovation itself on the other.

Figure: Decision Algorithm



Where: Invention - topic, progress in consciousness

Innovation - realized invention - decision leading to the goal

As long as creativity is the source of new ideas and change proposals, then innovation is the process of realizing new ideas and changes, otherwise innovations are practical changes and the ultimate effect of the creative activity itself.

The structure of creativity consists of:

- o Creative personality*
- oo Creative process*
- ooo Creative product*
- oooo Creative environment.*

The experts and world-leading innovators mentioned in the information sources confirm that in the realization environment of real business entities, especially in developed markets, it is possible to define creativity into groups according to the aspect of which the author of the definition emphasizes the conceptual apparatus. The creativity is:

- intellectual operation, where the center is divergent thinking and the creation of logical alternatives; i.e. a number of suitable outputs from the same information source;
- ability (summary of capabilities) to see and solve problems, where creativity is important not only for finding and mapping problems, but for solving them and the process of discovering problems is a fleeting and essentially unnatural phenomenon or impulse or vision, always guided by the goal, when it is often hidden below the threshold of consciousness, this is a known psychological problem;
- personality characteristics, otherwise emphasizing the appropriate positive mental constellation of the personality and professional characteristics of a creative manager or designer, as among other abilities one can speak of divergent independent thinking, intelligence, strong internal motivation to achieve and assert something, openness to new ideas, rich personal interests, sense of humor and the like;
- motivation combining creativity with appreciation of results and work in the cluster and society, while interacting motivation with inner personality and satisfaction of the creator.
- a product of thought, that is, a process that produces a particular systematically descriptive and tangible product, something new or something unusual;;
- an interaction where creativity interacts with the outside world and is not self-serving, builds on interpersonal communication and creates and shares new associations with the environment;
- the ability to overcome barriers, which in practice means courage and personality to convince themselves of their outcomes from the creativity process by defending them and pushing them into future innovations.

Several prominent foreign and domestic authors are dedicated to publishing various approaches to the issue of exploring and applying methods and procedures for creativity and innovation. It is the psychological elements and characteristics of staff that are an important factor in assessing and motivating the activities of individuals, either individually or in project or work teams. It is advisable to observe and describe the individual components of

the scheme and connections between them, depending on the respective stage of the process, production processes, activity content and emotional personality, in order to create a socially modern and successful product or process.

Details are described in the following figure, in which the individual elements are described in more detail, according to which these interactions are viewed as a way of perceiving and interpreting creativity as a way of applying intelligence and a way of organizing ideas in terms of psychological perception. The degree of creativity depends on the amount of divergence in handling the information that intelligence makes achievable.

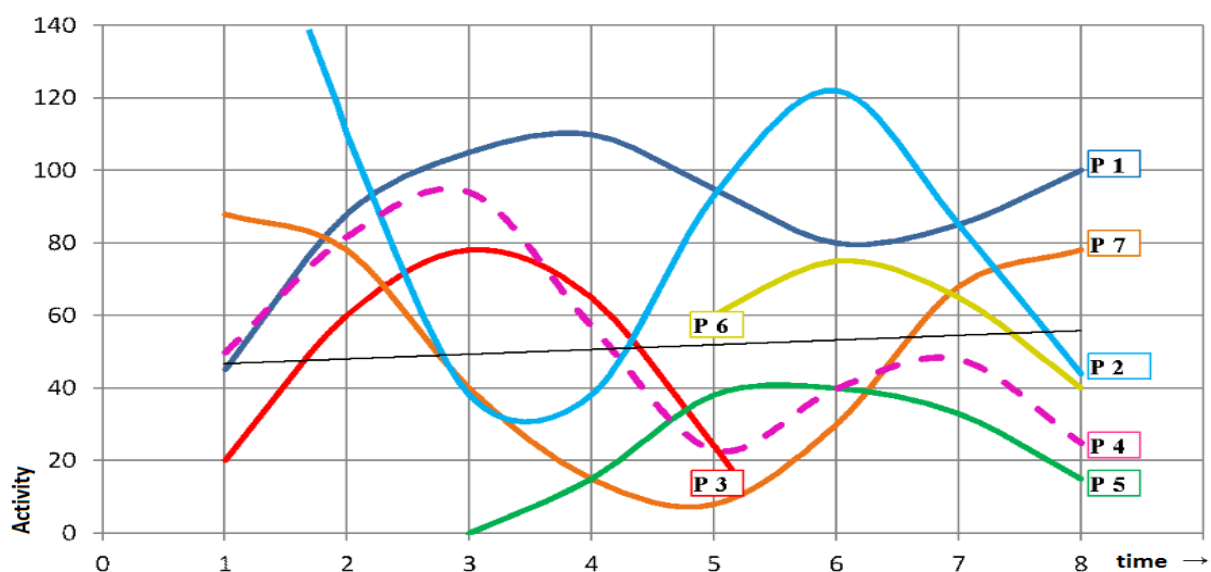
An even more information-oriented approach is the idea that intelligence is a kind of channel capacity, with creativity resulting from the flexibility and versatility of information delivered through that channel, while the lack of creativity under this scheme is the result of conventional information handling.

MANAGEMENT AND COORDINATION OF DESIGNING OF CLUSTER ORGANIZATIONS IN SPECIALIZING OF ENERGY AND ECOLOGY

The tools of business strategy and sales techniques as its organic part are modified activities in horizontal and vertical arrangement (with regard to the specific character of the company). These are pricing, bidding, the scope of services provided, the proclamation of conditions, the way of performing commercially promotional advertising.

If the project management accepts the situation that the same projects will be realized in the next period and the situation from the analysis would be repeated, it is possible to create and design a real-time business program and scope of activities, as shown in the following figure.

Figure: Proposal of activities and project planning in the cluster work program



It is clear from the picture that some projects start at T1, end at T8, but others start or end later - at T2, T3, T5, T8. The amount of activity value shows the start of those projects that are more significant e.g. P2, P6, others have lower baseline and continuous activity. The graph shows the severity of the workload of the cluster teams in a group of projects always in a given time zone T (vertical line and passing curves – e.g. at time T4, it is 6 projects at a time). The management and resources of the cluster must be responsibly prepared.

The proposal of concurrent planning activities of individual projects is followed by the breakdown of the business program into a real work plan, setting a timetable, duration of individual tasks within individual projects and marking the responsible teams. The diagram in the next order of the report shows a sample plan, elaborated according to the conditions and activities of the examined sample company in this work. Another important step after mastering the creation of the cluster work plan and the breakdown of individual projects of the decisive working groups in the project management process for each individual project.

The figure shows a simplified logical model that shows the basic relationships and the indicative assignment of an activity to a position that is responsible for processing and deciding on that activity or task at each step of the project. It is a concrete illustration and content of individual contents of planned projects, e.g. P1 project described above. Then the scheme of the project management process and their consistent coordination by the management is shown in the next figure.

Conclusion on planning and organizational activities, management can always reliably turn to the application of another tool in filling project roles - histogram. It is a very efficient, clear and reliable tool used for the scope of the planned work and time of each team member and the management in the hands of project management.

CURRENT STATE OF DEVELOPMENT OF INDUSTRIAL CLUSTERS IN SLOVAKIA

In a challenging competitive environment, only the most capable business entities benefit in the long run. As large corporations with a wide range of technical, material, personnel and financial background have a fundamental advantage in this respect, it is difficult to create an advantage especially for small and medium-sized companies with insufficient innovation capacity and lack of resources. This implies that current trends in the networking of such clusters and related research and education institutions.

Such clusters are more efficient, flexible and resilient to external influences than conventional hierarchical organizational arrangements. Their most important weapon is the transfer of knowledge and information, communication and creativity of individuals, as well as permanent self-education.

As a result of the creation of special - purpose clusters, the concentration and market dominance of companies that are interconnected by product, marketing and development are increasing. Cluster was defined as a term by Professor M. E. Porter as a geographical concentration of interconnected firms and institutions, specialized suppliers, service providers and industry partners in order to operate in this business sector and prioritize

cooperation over competitors. In fact, it is a way of organizing the production, service and distribution system and the processes associated with it at various sophisticated levels.

In general, the concept of clusters can be classified as a broader group of territorial innovation concepts with a regional impact on the catchment area. Nowadays, clusters are a global phenomenon because they have great local potential. However, many already have a global character and impact in several areas of business.

There are two types of clusters: those based on the value-added supply chain of the final producer (for example automotive clusters) and then competency-based clusters, oriented towards the application of specific solutions (for example IT technology).

Clusters in professional practice are also divided as follows:

Material-oriented organizations (e.g. woodworking activity)

Product-oriented organizations (like cars)

Technology-oriented organizations (e.g. laser research and technology)

Market-oriented organizations (such as services, sports, ...)

Problem-oriented organizations (e.g. ecology, ...)

Clusters create an environment for relationship efficiency, regional engagement and development, but especially for innovation and knowledge creation and new solutions, which has an impact on economic performance and employment in the field. They are proven innovators and movers of new ideas and solutions, they are knowledge-oriented, dynamic and combine the peculiarities of local and regional activities in a new quality.

They are much more willing to share and apply information on products and processes, and are significantly initiating the recovery of small and medium-sized businesses, which is particularly important in Slovakia's conditions.

Even in Slovakia, cluster began to form after some delay, and now it is already 25 industrial clusters, most of which are devoted to various industries, science and research, others are devoted to tourism in the regions.

Over the last decade, research to innovation has been dramatically changing and alternating. Innovation no longer means merely deliberate, new and beneficial change, solely in organizational and team context, and defining change or creating a new process or product as defined by some of the world's leading authors (Grossman and King, Roffe, Peters and Waterman, Pietrasinski, Drucker and others), but innovation also extends to organizational changes to achieve new concepts, flexibility and adaptability, especially for small and medium-sized businesses in the world markets and the progressiveness of their capabilities for the future with high production efficiency, permanent satisfaction of needs and expectations of current and future customers and sustainable social, energy and environmental environment.

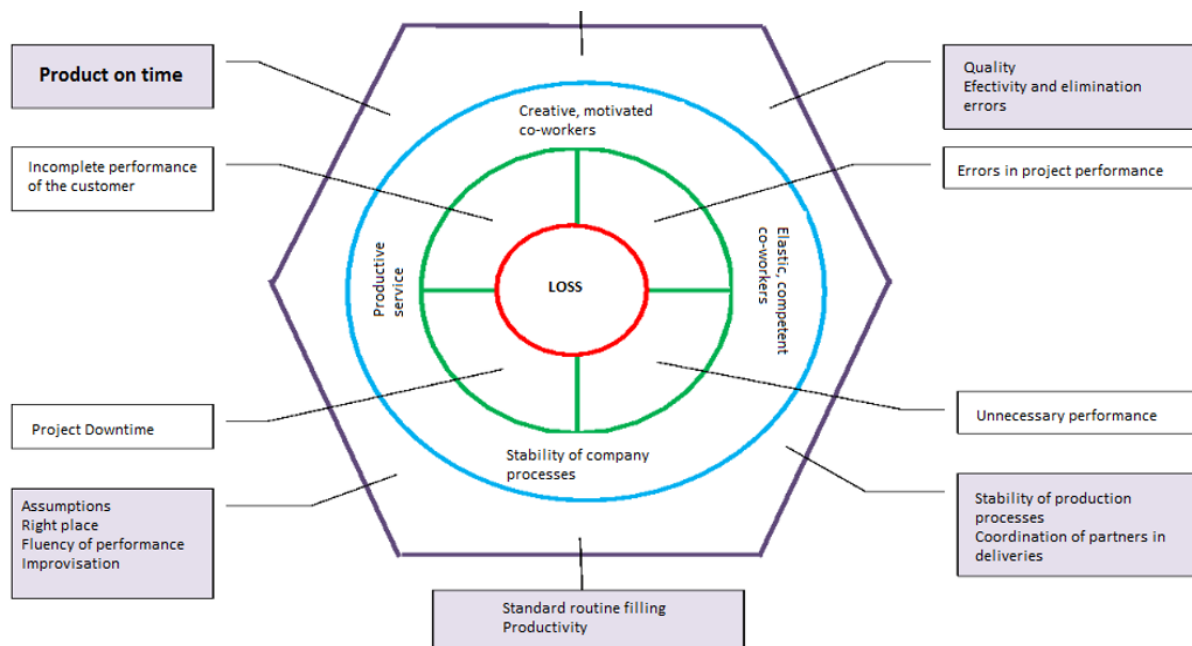
Managers today how to understand innovation not only as a management tool, but primarily as a process that can be managed, changed and influenced effectively for the success of a business to create a literally organic type of business capable of adapting to unstable and changing conditions and factors, and able to continually overcome problems. New phases of the innovation process have to be subordinated to this:

- 1. Producing ideas,*
- 2. Collection of ideas*
- 3. Developing and implementing ideas.*

Creativity and innovation in competition in the relevant regional, national, continental or even world market must be the result.

The figure shows the individual factors and processes in the cluster organization. With regard to personal development issues, management must not lose sight of the important knowledge that personnel resources are key, but at the same time the most risky. On the one hand, the cluster must preserve, support and make the best use of it, but is currently forced to continually reduce staff costs due to the competitive environment, dilettante interventions due to various social laws and regulatory constraints, but often its own inability to innovate, correct your business strategy and maintain a dynamic program and strategy.

Figure: Chart of factors and processes of cluster organization



The following figure shows essential information for management and decision-making of management in the innovation and product processes of that business entity or association, namely the perception of real impacts and error rates due to known factors of loss of efficiency of the company management system due to underestimation, non-registration of components.

Therefore, it is generally possible to talk about loss of efficiency 1 (addressing action instead of reaction) due to, for example, problems, action or causes in the system, loss of efficiency 2 (low interoperability of business units) due to regulations, standards, finance. , staffing of project teams, and personnel themselves in the performance of production and services, and ultimately a loss of effectiveness 3 (incorrect selection and application of analysis and work methods) by incorrectly implementing or ignoring methods such as ABC, PM, TQM, BSC, process or strategic management.

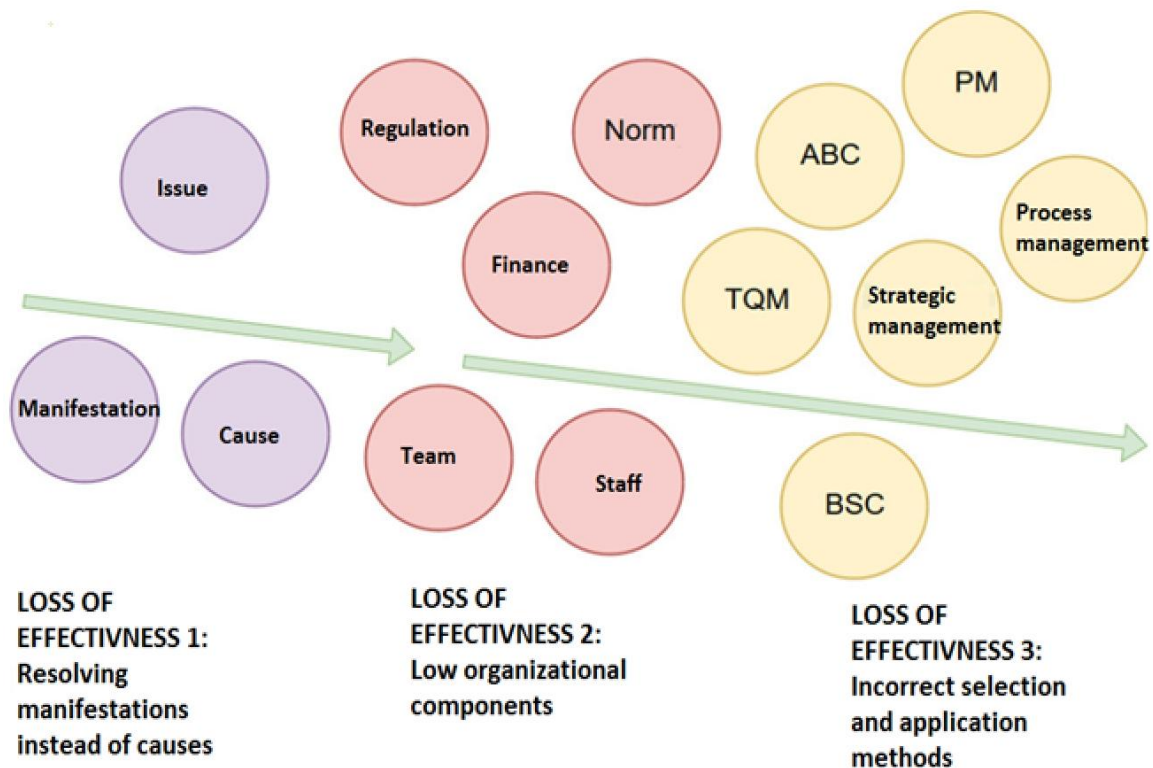
All these losses of efficiency consequently cause a gradual and descending chain of negative consequences in the system of the company functioning. Ensuring competitiveness and sustainability, the ability to survive and be creative are important criteria.

The following premise can be assumed:

- a) Business management is part of the cluster's business strategy and overall marketing management.

b) Business technique - sales technique is a specific manual, ie a summary of rules, tangible and intangible inputs, procedures and tasks for working with customers and a substantial output of the business sales system (providing specific activities) of the company.

Figure: Chaining of negative consequences in cluster management



CREATING AN INTEGRATED MODEL OF ECONOMIC EFFICIENCY AND FINANCIAL PERFORMANCE EVALUATION

In connection with the knowledge gained from the previous text of the research task report on selected models of measuring cluster performance on an economic basis and obtained parameters for them from the portfolio of members - from the area of SMEs (using VSMFR model) transparent final approach of the author team to the solution of the problem and implementation of the so-called integrated evaluation model, combining the benefits of both approaches, both standard and modern evaluation methods.

The figure below contains a concrete proposal of an integrated model for assessing financial performance and economic efficiency, elaborated and based on an information source for the needs of financial management of companies and clusters, operating primarily as SMEs.

The actual design of the model is based on the comparison and coherence of the two known models of efficiency evaluation, namely the VSMFR model and the VMMFR model, whereby the selection and determination of independent and dependent variables is cumulated into a common database of variables and their calculation based on economic profit.

Regression functions, sets for the investigated subject addressed to regression modelling from already selected indicators and performs quantification and interpretation of impacts of selected variables.

In practice, this is a complicated calculation and many companies and clusters cannot even get the necessary data for EVA.

Here, the existence of various national or transnational empirical databases serves as an aid, bearing in mind that if an organization wants to be successful, it is no longer sufficient to be profitable and satisfied with the standard calculation methodology, but also to monitor the potential for competitiveness and innovation. and capacities, both economical and productive, financial and innovative.

SELECTED PRESENTATIONS ON LECTURE WORKSHOP BLOCKS

Karabáč, Štefan: The role of SMEs in reducing energy consumption and increasing energy efficiency.

Clarification of the strategic objective of the energy policy of the Slovak Republic - to achieve competitive low-carbon energy, ensuring a secure, reliable and efficient supply of all forms of energy at affordable prices, taking into account the protection of consumers and sustainable development.

Naming the pillars of the Energy Policy of the Slovak Republic and the place and tasks of the cluster agenda in their fulfilment - energy security, energy efficiency and competitiveness, sustainable energy and ecology.

Possibilities for reducing energy intensity are ecosystem and infrastructure solutions, assessing adaptation measures for the future vulnerability of firms and strengths / weaknesses, risks, threats and potential opportunities.

Plesník, Ján: Innovations in the circular economy - retention properties and abilities of materials from recovered waste.

The concept of NERA - SK for circular economies is unique in Slovakia because it combines 3 principles - environmental, economic, social - into one system, with the aim of applying social and green public economy procedures to use modern LCA - EPD and LCC methods for creating partnerships with institutions, training in the local labour market and support for green SMEs.

The benefit is the transition to a circular economy and implementation in the general creation of green buildings using recycled materials and water retention and air conditioning of building operations.

Novotný, Tomáš: Creation of knowledge portfolio and energy and environmental clustering maps.

Formulating the conclusions of designing and implementing modern clusters and innovative habitats within them, namely in the field of energy, ecology and industry through selected methods of strategic analysis and a set of supporting diagnostic methods and tools.

Research in the project consists in analysing the level of innovation capacity of business entities within cluster innovation habitats, analysing the level of knowledge of management concepts, methods and tools, analysing the level of cluster management apparatus and analysing the attitudes of organizations to management interventions.

Kati, Róbert: Environmental Innovation and Industrial Investments - Practical experience of an SME representative over the course of the decade.

SMEs are a stable pillar of the Slovak economy. They employ 75% of the active labor force and account for more than 50% of gross production. Since 2012, SMEs have focused primarily on reducing fixed costs and focusing on environmental incremental innovations and industrial investment as a cluster activity.

Lukáč, Martin: Renewable energy sources.

The energy problem. Development of electricity balance and creation and scheme of operation of ENER bank system, development and creation of energy certificates in clustering SR. Energy cogeneration, biogas in innovative habitat.

Številová, Nadežda: Trends in environmental engineering research.

Solving current problems of environmental and material engineering in accordance with the concept of sustainable development in construction, support of excellent integrated research of progressive technologies of utilization of selected wastes in construction.

Báčová, Silvia: Energy class A0. Achievable reality in the revitalization of apartment buildings after 1.1.2021 ???

Legislative framework in the Slovak Republic and V4 countries, targets by 2030/2050? General state, isolated examples of solution and necessary changes in practice. Minimum energy performance requirements for buildings.

Jankovský, Július: Comparison of energy and economic efficiency of basic CHP methods based on fuel based on natural gas.

Comparison of the main problems of energy clustering in variations - cogeneration unit, heating plant, combustion turbine, steam - gas cycle. Basic indicators of heat supply - their values and models of thermal efficiency and their comparison.

Selník, Petr: Analysis of rainwater runoff on green roofs in urban environment.

On the construction of the roof for efficient loading and utilization of rainwater in urban areas. Tools, project procedures, benchmarks.

Tokarčík, Alexander: Energy management in production facilities

These are solutions in the company where the product implementation system (including production processes, support activities and innovations) is entered on the one hand by client requirements, project and capacity documents, objectives and plans, environmental parameters and on the other hand by history, technology, consultants and suppliers, the output is product and client satisfaction and it is presented as energy management.

This needs to be built in companies and cluster of innovation habitats with their own capacities and track results, measure and adopt solutions for improvement.



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