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USING CREATIVITY TECHNIQUES TO DEVELOP INNOVATIONS

The article analyses modern methods of stimulating creative thinking and defines their role in innovation processes. Based on a thorough review of the scientific literature covering 2010 to 2023, 166 creativity techniques were identified. The study's primary purpose is to systematize knowledge about enhancing creative thinking, identify their strengths and weaknesses, and develop a classification that allows one to navigate the wide range of available tools. The study analyzed techniques such as brainstorming, mind mapping, TRIZ, six thinking hats, morphological analysis, synectics, role-playing, and SCAMPER. The proposed classification provides for the division of techniques by complexity and functional purpose, allowing them to be considered tools for organizing the creative process, activating thinking, or algorithmic problem-solving. The results confirm the importance of creative thinking techniques in the modern world, where innovation is crucial in achieving success. Using these methods contributes to a more efficient search for new ideas and the developing of innovative products and services. It ensures the flexibility of organizations in adapting to changing market conditions. The proposed classification and conclusions of the study create the basis for further research and practical implementation in innovation management.

Keywords: *creative thinking, creativity techniques, innovations, TRIZ, Design thinking.*

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ВИКОРИСТАННЯ ТЕХНІК КРЕАТИВНОСТІ ДЛЯ РОЗРОБКИ ІННОВАЦІЙ

У статті проаналізовано сучасні методи стимулювання творчого мислення та визначено їх роль в інноваційних процесах. На основі ретельного огляду наукової літератури, що охоплює період з 2010 по

2023 роки, було ідентифіковано 166 технік креативності. Основною метою роботи є систематизація знань про методики активізації творчого мислення, визначення їхніх сильних і слабких сторін, а також розробка класифікації, яка дозволяє орієнтуватися в широкому спектрі доступних інструментів. У межах дослідження проведено аналіз таких технік як Brainstorming, Mind-mapping, TRIZ, Six Thinking Hats, Morphological Analysis, Synectics, Role-playing, SCAMPER та інших. Запропонована класифікація передбачає поділ технік за складністю та функціональним призначенням, що дозволяє розглядати їх як інструменти для організації творчого процесу, активізації мислення або алгоритмічного вирішення завдань. Результати підтверджують значущість технік креативного мислення в сучасному світі, де інновації відіграють ключову роль у досягненні успіху. Використання цих методів сприяє ефективному пошуку нових ідей, розробці інноваційних продуктів і послуг, а також забезпечує гнучкість організацій у пристосуванні до змін ринкових умов. Запропонована класифікація та висновки дослідження створюють підґрунтя для подальших наукових розвідок і практичного впровадження у сфері управління інноваціями.

Ключові слова: *креативне мислення, творчі методи, інновації, ТРВЗ (Теорія розв'язання винахідницьких задач), дизайн-мислення.*

Problem Statement. In the modern context of global competition and rapid technological advancement, innovation has become critical in ensuring the sustainable development of organizations, enterprises, and national economies. Developing innovations requires not only a high level of technical expertise but also the application of creative thinking, which enables the discovery of unconventional solutions and the generation of new ideas.

Creative techniques such as TRIZ (Theory of Inventive Problem Solving), Design Thinking, brainstorming, and other approaches are powerful tools for fostering innovation. They systematize the problem-solving process, incorporate diverse perspectives, and optimize resource allocation during development. By adopting a creative approach, companies can adapt to changing market conditions and stay ahead of competitors.

This article aims to analyze creative techniques, their advantages, and their specific applications in the innovation development process, as well as to explore the effectiveness of these methods through practical case studies. The study focuses on techniques such as TRIZ, Design

Thinking, and other approaches that enhance idea quality and reduce risks in innovation implementation.

The findings of this research are valuable for practitioners involved in implementing innovations across various sectors and for scholars studying modern approaches to creative management.

Analysis of Recent Research and Publications. The modern world is characterized by the accelerating pace of environmental changes affecting organizational activities. Today, the ability to adapt flexibly, primarily through innovation development, is one of the critical competitive advantages. According to the BCG Global Innovation Survey 2023, approximately 80% of respondents ranked innovation among their top three priorities, with two-thirds identifying it as their top priority (BCG, 2023). Thus, innovation and creativity, as a prerequisite for innovation, have become fundamental factors determining organizational success (Anderson, N., Potočnik, K., Zhou, J., 2014).

Idea generation can occur internally within an organization through its employees or externally by engaging specialized experts. The primary advantages of the first approach include a deep understanding of internal processes and control over employee activities. Meanwhile, the second approach offers the benefit of leveraging the diverse experience of external specialists acquired through solving tasks for various organizations.

According to Teresa Amabile's componential model of creativity, in both cases, the key factors influencing the performance of individuals involved in idea generation are the presence of domain-relevant expertise, creativity-relevant skills, intrinsic motivation, and the social environment (Conti, R., Coon, H., & Amabile, T. M., 1996).

One critical factor, creativity-relevant skills, depends, in Amabile's view, on training, experience in idea generation, and personality characteristics. Personality characteristics, such as intrinsic motivation, tolerance for ambiguity, openness to new experiences, and persistence, are generally intrinsic qualities an individual brings to a project. Selecting specialists with the necessary personality traits and relevant expertise is typically a function of the HR department.

As noted by the author, the factors of training and experience in idea generation are most closely aligned with knowledge and skills in applying creativity techniques during the development of innovations. These techniques serve as the cornerstone for an effective process of generating innovative ideas. Throughout history, people have sought to develop and apply methods for solving inventive problems and finding answers to pressing questions.

As highlighted in the author's dissertation, humanity has, over time, not only created and refined consumer goods and means of production but also developed methodologies for generating ideas that enable the creation of new or improved objects (Stasovskyi, Y., 2024). For instance, in the 5th century BCE, Socrates stimulated creative thinking to seek truth through dialogues involving questions and answers (Jowett, B., 1923). Twenty-three centuries later, we observe the modification of Socrates' method in the creativity technique known as the "5 Whys," introduced by Japanese engineer Sakichi Toyoda, the founder of Toyota Industries, to identify the root causes of issues. Initially designed to resolve manufacturing issues, this technique has since gained popularity in various fields, including business and management (Ohno, T., 1988).

Recognizing the growing importance of innovation, researchers and practitioners have intensified their exploration of creativity techniques, which facilitate the development of innovative products.

The author defines a creativity technique as fostering and utilizing creative thinking to solve problems and generate new and valuable ideas (Stasovskyi, Y., 2024). Given the variety of existing creativity techniques, organizations must identify which methods align most closely with their goals.

The Article aims to identify the creativity techniques most actively researched and applied in contemporary practice and those with the potential for practical use by organizations in developing innovations. The study aims to provide a concise overview of these techniques, analyze them, and create a classification that enables a systematic approach to their selection and implementation in innovation processes.

Presentation of the Main Research Material. The author conducted a literature study that included several stages to identify creativity techniques, review them, and develop their classification. A search was performed on the academic research platform academia. edu (using the Academia Premium package) with the essential phrases creativity technique and creativity techniques. The time frame was limited to 2010 – 2023 to ensure data relevance.

The search query was narrowed to the analysis of source titles, after which duplicates and materials unrelated to innovation topics were excluded. As a result, creativity techniques mentioned in each selected source were identified. Techniques cited in at least three sources were included in the study.

After the initial selection, the creativity techniques were categorized based on their level of complexity. Additionally, the methods were

classified according to their principles of action or mechanisms of influence in creative thinking and problem-solving.

The author conducted a similar study in their dissertation for 2012 – 2022 using the search phrase creativity techniques (Stasovskyi, Y., 2024). For this study, the time frame was extended, and the selection was expanded by adding the search phrase creativity technique.

As a result, 43 sources were selected, identifying 166 names of creativity techniques. The techniques were sorted by the number of mentions, adhering to the principle of "one source – one mention." Names of techniques with variations in spelling, such as Mind mapping, Mind mapping, mind mapping, and mind-mapping, were treated as the same technique. The inclusion criterion for the study was at least three mentions.

Figure 1 presents the number of mentions of creativity techniques in a diagram based on the analysis.

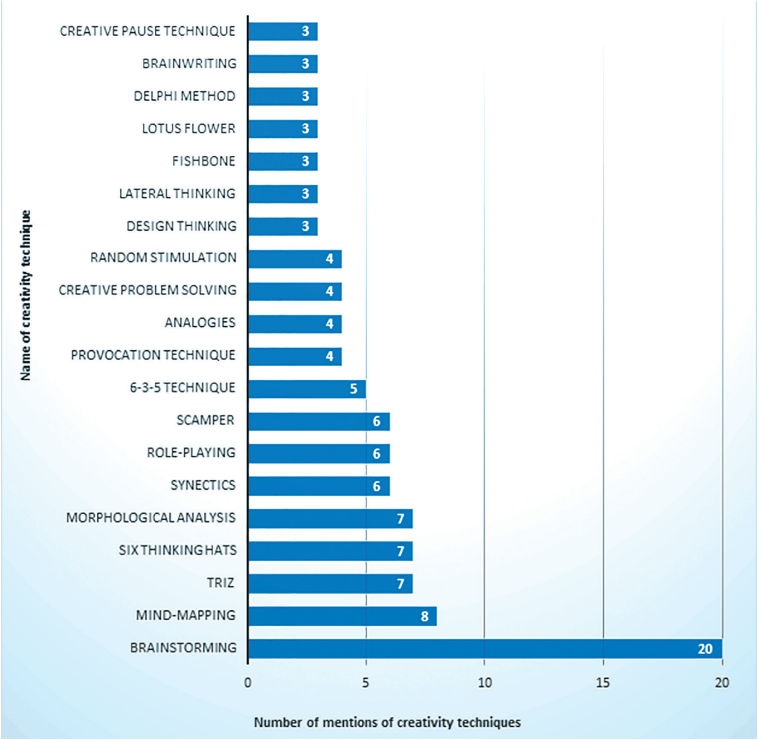

Figure 1. Number of Mentions of Creativity Techniques

As shown in the diagram, brainstorming (20 mentions) was the most mentioned technique, and its popularity exceeds other techniques by more than twice. Additionally, 22 variations of Brainstorming were identified (e.g., Reverse Brainstorming, Stop-and-go Brainstorming, Individual Brainstorming, Anonymous Brainstorming, Didactic Brainstorming, Symbolic Brainstorming, etc.). Only Brainstorming was included in the count, as other variations did not meet the three or more mentions criterion.

The most popular techniques were mind-mapping, TRIZ, Six Thinking Hats, Morphological Analysis, Synectics, Role-playing, SCAMPER, etc.

Thus, the conducted study allowed the formation of an up-to-date database on creativity techniques, their popularity, and specific usage features, creating a foundation for their further implementation in the innovative activities of organizations.

The author conducted a detailed analysis of each selected creativity technique, preparing a concise description of their key characteristics.

Table 1. Classification for Creativity Techniques

Classification	Method	Description	Application Area	Advantages
Idea Generation	Brainstorming	Group or individual generation of ideas without criticism to solve a specific problem.	Business, education, design, strategic planning	Stimulates creativity reduces communication barriers.
	Six Thinking Hats	Dividing thinking into six directions for a comprehensive analysis of ideas.	Management, psychology, strategic analysis	Encourages structured thinking.
	Lateral Thinking	Departing from linear thinking to find unconventional solutions.	Technology, innovation, problem management	It helps overcome cognitive limitations.
Problem Analysis	5 Whys	Sequentially asking "Why?" to identify the root cause of a problem.	Quality management, process diagnostics	Identifies root causes of issues.

Continuation of the table 1

Classification	Method	Description	Application Area	Advantages
	SWOT Analysis	Analyzing strengths, weaknesses, opportunities, and threats.	Strategic planning, marketing	Clearly defines critical factors.
	Ishikawa Diagram	A graphical method to identify the causes of problems.	Project management, operations management	Visualizes complex relationships.
Innovative Methods	Morphological Analysis	Systematic exploration of all possible combinations of characteristics of a product or idea.	Engineering, product development	Ensures a comprehensive approach to design.
	TRIZ (Theory of Inventive Problem Solving)	Methodology for creating innovative solutions by analyzing inventive problems.	Science, technology, industry	Facilitates innovation forecasting.
Visualization of Ideas	Mind-mapping	Creating mind mapping to structure ideas.	Education, creativity, planning	Simplifies memorization and organization of ideas.
	SCAMPER	A checklist of questions to modify an existing product or process.	Marketing, product design	Simple structure for iterative improvement.
Heuristic Methods	Analogies	Using analogies to generate new ideas.	Creativity, advertising, product development	Inspires unconventional solutions.
	Reverse Brainstorming	Analyzing ideas in terms of their weaknesses.	Risk management, strategic planning	Identifies potential threats.

End of the table 1

Classification	Method	Description	Application Area	Advantages
Collaborative Methods	Delphi Method	Expert surveys to achieve consensus in a group.	Forecasting, strategic analysis	Anonymity ensures objectivity.
	Nominal Group Technique	Group idea generation followed by voting.	Project management, strategy development	Balances individual and group ideas.
Game Techniques	Role-Playing	Simulating situations to find solutions or develop ideas.	Training, product development, psychology	Realistic modeling of scenarios.
	Gamification	Using game elements in the creative process.	Marketing, HR, education	Enhances motivation and participant engagement.
Digital Tools	Creativity Software (e.g., Miro, Notion)	Digital tools for visualization and collaborative work on ideas.	Remote work, collaboration	Simplifies communication and idea integration.

Brainstorming is a creativity technique aimed at generating many ideas in a group format. Its core concept is creating conditions where participants can freely express ideas without prior evaluation, stimulating unconventional thinking. The process involves defining the task, actively generating ideas, structuring them, and subsequently evaluating and selecting the most promising ones. Brainstorming enhances creativity, expands the range of possible solutions, fosters team interaction, and effectively solves relatively simple problems quickly. However, potential drawbacks include the dominance of more active participants, the presence of unrealistic ideas, and challenges in processing many proposed solutions (Osborn A., 1957).

Mind mapping, as a technique for visualizing and structuring ideas, allows the representation of relationships between concepts through a graphical map. The central idea is placed in the middle, with branches

radiating outward, representing subordinate concepts or associations. This method fosters idea generation and helps organize large amounts of information. Mind mapping enhances memory through visualization, aid in understanding complex concepts, and reveals new connections. However, drawbacks include the subjectivity of perception, differences in individual maps created by various people, and difficulties in handling significant amounts of information without adequate skills (Karlijn L. van den Broek, 2021).

TRIZ (an acronym for «Teoriya Resheniya Izobretatelskikh Zadach») is a systematic methodological approach to analyzing and solving engineering, scientific, and innovative problems based on identifying and resolving contradictions. In TRIZ, a contradiction is understood as a conflict between desired and actual system characteristics. The fundamental principles of TRIZ include identifying contradictions through detecting mutually exclusive requirements for a system, applying standard solutions using universal techniques (40 fundamental principles) to resolve typical contradictions, and algorithmizing the resolution process by following a precise sequence of actions (Altshuller, G., 2012; Petrov, V., 2020).

The advantages of TRIZ lie in its systematic nature, which ensures a structured approach to problem-solving; its universality, making it applicable across various fields; and its ability to stimulate the search for genuinely original solutions by utilizing advanced knowledge from different scientific domains. However, the complexity of TRIZ requires a certain level of training and understanding of its basic concepts. Additionally, the abstract nature of some techniques may demand further interpretation, making their application challenging.

The Six Thinking Hats technique is a creativity method designed to structure the thinking process. The essence of the technique lies in sequentially analyzing a problem through the perspective of six different «hats», each representing a specific mode of thinking. Participants take turns «wearing» each hat and express their thoughts according to its function, enabling a comprehensive problem analysis and fostering creative solutions.

The thinking modes include white (objective analysis of facts, gathering information), green (idea generation), yellow (positive analysis, identifying advantages), red (emotional evaluation, intuition), black (critical evaluation, identifying flaws), and blue (process control, summarization). Although the sequence of «wearing» the hats can vary, the process usually begins with the white hat (gathering facts), progresses through

the other colors, and concludes with the blue hat for summarization (De Bono, E., 1985).

The advantages of this technique include providing a clear structure for organizing thoughts and analyzing information, considering problems from multiple perspectives such as logic, emotion, creativity, and critical thinking, and avoiding emotional conflicts while focusing on problem resolution. However, participants must strictly follow the rules and understand the role of each «hat». For complex problems, the process can be time-consuming, require an experienced facilitator, and pose challenges for large groups.

Morphological Analysis is a creative technique used to systematically explore systems and generate new ideas. It involves decomposing a problem (system) into individual, independent parameters and subsequently generating all possible combinations of these parameters. This approach enables the discovery of new solutions that may need to be noticed during intuitive searches.

Key stages include decomposing the system into separate interrelated elements, defining a set of options for each parameter, compiling all potential variants into a morphological matrix, generating solutions by synthesizing combinations from the matrix, and evaluating and selecting solutions based on specified criteria (Zwicky, F., 1969).

The technique's advantages lie in its systematic nature, ensuring a comprehensive enumeration of possibilities, minimizing the influence of subjective factors, and allowing for a multifaceted examination of problems. However, challenges arise with increased parameters, requiring significant computational resources and leading to the generation of solutions that may not always be practically implementable.

Synectics is a creative technique to solve complex problems by creating new associative connections between known and unknown concepts. The fundamental principle of Synectics is to «make the familiar strange and the strange familiar». This method relies on analogies as critical tools for generating innovative ideas, distinguishing five analogies: direct, personal, symbolic, figurative, and fantastical. A team using the Synectics method typically consists of experts from various fields, enabling diverse approaches and perspectives in problem-solving.

The implementation of Synectics involves several stages: defining the problem to be discussed, incorporating experts from relevant fields, stimulating participants to explore unconventional analogies, analyzing each analogy for relevance and practical applicability, developing concrete

solutions based on selected analogies, implementing the most effective solutions, and refining the Synectics process based on the experience gained (Gordon, W. J. J., 1961).

The advantages of Synectics include stimulating non-trivial solutions through unconventional analogies, leveraging a multidisciplinary team to generate a broader spectrum of ideas, and combining elements of logic, factual analysis, imagination, and synthesis, resulting in a structured yet open process for radical innovation. However, Synectics demands a high level of participant preparation, abstract thinking, and associative analysis and an experienced moderator to guide the process effectively.

Role-playing is a creativity technique that involves simulating real or hypothetical situations related to the development and implementation of innovations. Participants assume roles (e.g., users, developers, investors, managers) and interact within a defined scenario. This method allows researchers to observe participant behavior in controlled conditions and analyze various social and cognitive processes.

The stages of a role-playing session include defining the goal of the game, developing a scenario with detailed descriptions of the situation, roles, and tasks, preparing necessary materials (presentations, instructions, prototypes), conducting the game with active moderation, and analyzing the outcomes (Bateson, P., & Martin, P., 2013).

The advantages of this technique include active participant engagement, adaptability to different contexts and problems, and the ability to test ideas and gather feedback quickly. However, challenges include subjectivity, as results depend on participants' perspectives, lengthy preparation and execution, the need for an experienced facilitator, simplification of real-world scenarios, and the risk of ineffective time usage if the game is poorly designed.

SCAMPER is a creative thinking and problem-solving technique used during brainstorming sessions to find unconventional solutions by shifting perspectives. It involves applying specific questions based on each element of the acronym: Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, and Reverse.

The process includes defining the task or problem, selecting an object of analysis (e.g., a product, process, or idea), and sequentially applying each SCAMPER operation while answering relevant questions. For example, Substitute asks whether a component can be replaced and with what; Combine explores what elements can be merged; Adapt considers how the object can be adjusted for different uses; Modify

examines changes in characteristics; Put to another use suggests alternative applications; Eliminate identifies unnecessary elements; and Reverse explores opposite approaches. After generating ideas, they are analyzed for feasibility, practicality, and potential benefits, leading to the selection of the best solutions (Ozyaprak, M., 2016).

The advantages of SCAMPER include its ability to provide a structured approach to brainstorming, enable participants to view problems from various angles, and be simple and versatile in application. However, its effectiveness may depend on the specific context or situation, and it often requires group brainstorming sessions, which may only be suitable for some types of challenges.

The 6 – 3 – 5 Technique is a simple yet effective tool for stimulating creativity and generating ideas within a group. It is applicable across various fields for solving diverse problems. The core of this method lies in a cyclic process of idea recording by small groups within a limited timeframe, enabling each participant to express their thoughts while drawing inspiration from others' ideas.

The process involves forming a group of six participants, each of whom writes down three ideas related to the task within five minutes. The sheets with recorded ideas are passed around the group, and each participant adds three new ideas based on the existing ones. This process is repeated until all sheets return to their original authors (Wodehouse, A., 2011).

Advantages of the 6 – 3 – 5 Technique include its speed in generating ideas, minimizing dominance by more active participants, and fostering synergy through mutual inspiration. However, its limitations lie in the restricted time, which may lead to superficial exploration of ideas and the absence of detailed analysis of the generated ideas.

The Provocation Technique deliberately disrupts established perceptions and patterns, encouraging participants to step beyond conventional thinking. This method allows teams to uncover new perspectives and develop innovative solutions.

The stages of implementation include forming a group of 3 – 5 participants, defining a specific problem to be addressed, formulating a provocative statement related to the problem, discussing the statement while expressing diverse opinions and arguments, generating ideas by recording even the most unexpected ones and analyzing and selecting the most promising ideas (Pangrazio, L., 2017).

The technique's strengths lie in its ability to challenge conventional approaches, stimulate unexpected associations, and enhance participant

engagement through provocative statements. However, its effectiveness may diminish in solving complex technical problems, and overusing provocation may lead to participant burnout. The success of this technique heavily depends on the moderator's experience and knowledge.

The Analogies technique establishes connections between known objects, phenomena, or processes and those being studied or modified. This method facilitates the transfer of knowledge and experience from one domain to another, opening new perspectives and fostering the emergence of innovative ideas.

The process involves defining the problem, selecting a base object or phenomenon with similar characteristics to the problem, identifying correspondences between the properties of the base object and the situation, transferring knowledge about the base object to the problem to find new solutions or explanations, and analyzing the results (Gentner, D., & Smith, L. A., 2013).

The advantages of this technique include its broad applicability across domains, lack of requirement for specialized skills, and ability to push beyond standard approaches. However, its effectiveness depends on individual associations and experience, and finding profound and relevant analogies may only sometimes be achievable.

Creative Problem Solving (CPS) is a structured approach to generating innovative solutions, combining divergent and convergent thinking. Unlike traditional brainstorming, CPS provides a more systematic and analytical process for evaluating and selecting the best ideas for implementation.

The process consists of defining the problem, generating many ideas using various techniques, evaluating the ideas based on specific criteria, and developing and implementing the selected solutions (Gentner, D., & Smith, L. A., 2013).

The strengths of CPS include its structured nature, which ensures a systematic problem-solving approach, and its applicability to a wide range of challenges. However, the process can be time-consuming, and the evaluation of ideas often relies on subjective judgments influenced by participants' experiences and beliefs.

Random Stimulation involves using random elements to encourage unconventional thinking and generate new ideas. The technique operates on the principle that randomness can disrupt habitual thinking patterns and foster unexpected associations.

The process includes selecting a random stimulus (e.g., a word, image, phrase, number, or object), establishing connections between the

stimulus and the problem, generating ideas based on these connections, and analyzing the generated ideas (Guilford, J. P., 1967).

The advantages of random stimulation are its ability to offer fresh perspectives on problems and its simplicity of use, which requires no special skills. However, its limitations include the potential need for more valuable ideas and additional refinement and evaluation of the ideas generated.

Design Thinking is not merely a technique but a philosophy that places humans at the center of the development process. It is an iterative approach that enables the creation of innovative solutions tailored to real user needs. Thanks to its flexibility and user-centered orientation, Design Thinking is applicable across various industries. Fundamental principles of this approach include user focus, iteration, teamwork, and prototyping.

The process begins with a deep understanding of user needs and desires through observation and research, followed by the precise formulation of the problem to be solved. A wide range of ideas is generated, leading to prototyping, where simple models are created to test these ideas. Finally, testing is conducted with users, incorporating feedback and making necessary adjustments (Brown, T., 2009).

The advantages of Design Thinking lie in its focus on user needs, increasing the likelihood of success for developed solutions. Its iterative cycle of testing and improvement ensures the creation of refined products, while the involvement of diverse specialists promotes a comprehensive examination of the problem. However, the process can be time-consuming, particularly for complex issues, and the interpretation of research results and idea generation may be subjective, varying among individuals. The effectiveness of this approach heavily depends on the facilitator's skills, who must foster trust, stimulate creativity, and guide discussions effectively.

Lateral Thinking is a creativity technique that generates new ideas by consciously breaking habitual thought patterns. Unlike vertical thinking, which relies on logical, sequential steps, lateral thinking employs intuitive, unexpected ideas and associations to approach problems.

The process involves defining the problem through the precise formulation of the task or challenge, generating ideas by revisiting traditional assumptions, using random external elements as stimuli, considering the situation from an opposing viewpoint, and applying provocation to create unconventional questions. Promising ideas are

selected for further analysis and refinement, followed by evaluating and adapting these ideas for implementation.

The advantages of Lateral Thinking include its ability to deliberately break habitual thought patterns and leverage random stimuli to generate unexpected ideas. However, the generated ideas may be challenging to implement, and effectively using this technique requires specialized skills and experience (de Bono, E., 1970).

The Fishbone Diagram is a creativity technique designed to systematically and thoroughly analyze complex problems and identify innovative solutions. It structures the process of exploring cause-and-effect relationships between various factors influencing innovation processes, products, or services. This tool is particularly effective for uncovering hidden causes of problems that hinder innovation or prevent achieving desired outcomes.

The process involves defining the primary problem or challenge in introducing new products, services, or processes. A diagram is constructed with the problem represented as the "head" of the fish, a spine extending from the head, and diagonal lines ("bones") branching off to define the main categories of causes. Brainstorming is conducted to identify possible causes within each category, followed by analyzing and prioritizing these causes. A plan of action is then developed to address the identified causes.

The advantages of the Fishbone Diagram include its ability to visualize all potential causes of a problem, fostering a better understanding of the situation. It provides a systematic approach to problem analysis and helps identify root causes rather than symptoms. However, creating a detailed diagram can be time-consuming, identifying interrelationships may be challenging, and this method may only be suitable for some problem types, especially those requiring more dynamic approaches.

The Lotus Flower technique is a visual method for generating ideas based on the principle of associative thinking. It helps structure thoughts and expand the boundaries of conventional thinking. Ideas are represented in a diagram resembling a blooming lotus flower, which facilitates visualizing connections between different concepts.

The process begins with selecting a core problem or concept, which is visually depicted at the center (the core of the lotus). Associations are then generated as «petals» of the lotus. The more associations generated, the more petals unfold, leading to the creation of new ideas. First-level associations become the centers for the next level, and the

process repeats. Ultimately, the most promising ideas are selected for further development (Gavrilă, C., & Tulbure, C., 2018).

The advantages of the Lotus Flower technique include generating many ideas, gradually unfolding associations that enable a more profound exploration of the problem, and revealing unexpected connections between different concepts. However, effective use requires specific visualization and associative thinking skills, and creating a detailed diagram can be time-consuming and dependent on the initial idea.

The Delphi Method is a systematic approach to collecting and analyzing expert opinions to achieve consensus on complex issues, particularly those related to future developments. Its essence lies in conducting multiple rounds of surveys and providing feedback among experts to reach an agreement on a given topic. The anonymity of the study encourages experts to express their views freely, without peer pressure. This method is widely used for decision-making under uncertainty and assessing the potential of emerging technologies.

The process involves selecting a group of experts with deep knowledge in the relevant domain, formulating a straightforward question or task, and conducting several rounds of surveys. In the first round, experts anonymously respond to the posed questions. The results are summarized and shared with the participants, who then revise their initial evaluations based on the feedback. This cycle is repeated until a sufficient level of consensus is achieved (Fink-Hafner, D., 2019).

The advantages of the Delphi Method include its anonymity, which allows experts to express their views freely; its ability to capture diverse opinions and perspectives; and its logical and sequential process, which can be adapted to various tasks. However, the method can be time-consuming, requires the involvement of highly qualified specialists, and poses challenges in data analysis.

Brainwriting is an interactive idea-generation method involving the written exchange of thoughts among group participants. Unlike traditional brainstorming, where ideas are voiced aloud, brainwriting enables participants to articulate their thoughts more thoughtfully while avoiding the influence of others. Early stages often anonymize authorship, fostering openness and reducing fear of criticism.

The process involves forming a group of 3—5 participants with diverse backgrounds, formulating a clear and specific task, and individually generating ideas. Each participant writes their ideas on a sheet or in a shared digital document within an allotted time. These sheets are then

passed to another participant, who builds upon the existing ideas or contributes new ones. After completing the cycles, all ideas are collected, and the most promising ones are selected for further development (Paulus, P. B., & Kenworthy, J. B., 2019).

The strengths of brainwriting include equal contributions from all participants, fostering freedom of expression, maintaining a written record of ideas for future reference, and generating a high volume of ideas. Limitations include potential duplication of ideas, misinterpretation of written concepts without discussion, and difficulties expressing complex ideas in writing.

The Creative Pause Technique intentionally interrupts the flow of thought to focus on details that might otherwise go unnoticed. This pause allows the mind to rest and process information subconsciously, often leading to new insights and solutions. Short breaks enable the brain to switch to a creative state, reducing cognitive load and fostering fresh approaches to problem-solving. The process includes consciously pausing without a specific reason, diverting attention to certain aspects or details, and returning to the main task (de Bono, E., 1992).

Advantages include its simplicity, requiring no special tools or techniques, and its ability to reduce stress and restore mental energy. However, maintaining discipline for regular application and avoiding excessive pauses that could disrupt task focus are potential challenges.

The analysis of the selected creativity techniques concluded that some (termed Simple Techniques) are integral components of others, more complex techniques (termed Complex Techniques). For instance, analogies (simple techniques) are embedded within TRIZ, Synectics, and lateral thinking, which are complex techniques. Similarly, Six Thinking Hats, Creative Pause Technique, Provocation Technique, and Random Stimulation are also Simple Techniques and part of Lateral Thinking. The 6-3-5 Technique is a more detailed variation of Brainwriting.

Despite some overlap (since Simple Techniques are components of Complex Techniques), the author retained Simple Techniques for further exploration. This decision is justified by their popularity, simplicity of use, and applicability for solving straightforward tasks or complementing other methods. Complex Techniques typically have well-defined stages and a structured approach. They require a high level of detail and a deep understanding of the problem and its components, often incorporating Simple Techniques within their framework.

Based on the conducted analysis, the author divided the selected creativity techniques into Simple Techniques and Complex Techniques and further categorized them into three main groups according to their principles or mechanisms of action.

The first category focuses on organizing the creative thinking process. Techniques in this category structure and manage the process of idea generation. They ensure productivity and orderliness in the creative process, facilitating effective idea generation, evaluation, and implementation management.

The second category emphasizes the activation of creative thinking. These techniques stimulate creativity, overcome psychological inertia, and encourage participants to think beyond conventional approaches. They help generate new and unconventional ideas, offering fresh problem-solving perspectives.

The third category encompasses algorithmic methods, which involve structured processes for systematic problem-solving. Defined steps and algorithms allow for systematic work on tasks, enabling thorough analysis and the generation of solutions.

These categories are not mutually exclusive; thus, some techniques may belong to multiple or all categories.

The distribution of the selected creativity techniques is presented in Table 2.

Table 2. Distribution of Creativity Techniques by Complexity and Principle or Mechanism of Action

№	Name of the creativity technique	Complexity of creativity techniques		The principle or mechanism of action of the creativity technique		
		Simple	Complex	Organization of the creative thinking process	Activation of creative thinking	Algorithmic methods
1	Brainstorming	X		X	X	
2	Mind-mapping	X		X	X	
3	TRIZ		X	X	X	X
4	Six Thinking Hats	X		X	X	
5	Morphological Analysis		X	X		X

End of the table 1

№	Name of the creativity technique	Complexity of creativity techniques		The principle or mechanism of action of the creativity technique		
		Simple	Complex	Organization of the creative thinking process	Activation of creative thinking	Algorithmic methods
6	Synectics		X	X	X	
7	Role-playing	X			X	
8	SCAMPER	X		X	X	
9	6-3-5 Technique	X		X	X	
10	Provocation technique	X			X	
11	Analogies	X			X	
12	Creative Problem Solving		X	X	X	
13	Random Stimulation	X			X	
14	Design thinking		X	X		X
15	Lateral thinking		X	X	X	
16	Fishbone		X	X		X
17	Lotus flower	X		X	X	
18	Delphi Method	X		X		X
19	Brainwriting	X		X	X	
20	Creative Pause Technique	X			X	
	Sum	13	7	15	16	5

The findings of this study indicate that most popular creativity techniques are simple and are primarily used to activate creative thinking and organize the creative thinking process. Their popularity can be attributed to their flexibility and ease of use. In contrast, Complex

Techniques are less commonly employed but include structured approaches and algorithmic methods, making them more effective for solving complex problems.

Among the most advanced creativity techniques are TRIZ and Design Thinking. TRIZ stands out for its high level of systematization and universality, comprising diverse methods and scientific approaches for addressing engineering and innovative challenges. Design Thinking, with its action-oriented algorithm, focuses on identifying and meeting user needs. It includes stages such as empathy, problem definition, idea generation, prototyping, and testing. This iterative process ensures the creation of user-oriented innovative solutions through continuous improvement.

The use of creativity techniques for developing innovative products is gaining increasing importance. However, despite significant progress in this field, numerous aspects require further investigation and enhancement. Based on the research results, several vital directions have been identified that could contribute to advancing the theory and practice of creative thinking while enhancing the efficiency of organizational innovation processes.

One promising area for future research is exploring the impact of various training methods and programs on the development of creative skills. Investigating the effectiveness of educational initiatives that foster creativity among employees could lead to the design of more efficient training programs and workshops.

Another vital direction involves examining the influence of digital platforms on the effectiveness of creative thinking and idea generation. Such research could facilitate the integration of modern technologies into innovative processes, increasing their efficiency and accessibility. Particular attention should be given to developing digital tools that support complex creativity techniques, such as TRIZ and Design Thinking.

Additionally, a comparative analysis of the effectiveness of creativity techniques across different industries — such as IT, agriculture, healthcare, education, and finance — would be highly beneficial. This would enable the identification of industry-specific characteristics and the determination of techniques most relevant to the unique needs of each sector.

Conclusions. The research confirms creativity techniques' critical role in contemporary science and business. Analyzing the scientific literature has enabled the systematization and classification of various methods for stimulating creative thinking, which organizations actively use to develop innovative solutions.

The study highlights the high popularity of Brainstorming, mind-mapping, TRIZ, and Six Thinking Hats. Despite differences in complexity and areas of application, all these methods share a common goal – generating new ideas and solving problems effectively. Notably, more complex techniques like TRIZ exhibit higher efficiency while requiring additional preparation due to their systematic and algorithmic nature.

To successfully integrate creativity techniques into organizational culture, it is recommended to begin with external consultants' involvement in training and facilitating creative processes. This initial step allows staff to quickly learn various methods and identify the most relevant techniques for specific tasks.

In the subsequent stage, organizations should establish an internal unit responsible for innovation development. Such a unit can independently apply complex creativity methods, ensuring a continuous flow of new ideas and solutions.

Thus, systematically implementing creativity techniques is a strategic measure for enhancing an organization's innovative capacity. Further research in this field aims to develop new methods, adapt existing ones to the specific needs of various industries, and explore the psychological aspects of the creative process.

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