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THE USE OF THE "DESIGN-THINKING" AND "SEVEN HATS" METHODS AT THE PROJECT INITIATION AND PLANNING STAGE

Annotation. *The article is devoted to the comparison of tools for analyzing innovative ideas, such as "design thinking" and the modified "seven hats" method. Both methods are actively used in project management at the initiation and planning stages. The technology of generation, analysis and selection of creative ideas of projects based on the combination of these two approaches when working in a team is considered. The article is a continuation of the authors' research in the field of creative thinking problems, both in the field of education, and in the field of professional project and program management. The results can be used to develop a theoretical framework for project management at the stage of generating ideas and initiating projects.*

The logic of the process approach of the design-thinking method echoes the logic of using the modified seven hats method. Therefore, the authors propose to use in the work of project teams at the stage of project initiation a modified "seven hats" method together with the "design-thinking" method. At the stage of consideration of the project idea, it is proposed to approach the development of the idea step by step, since this is required by the "design-thinking" method, and at each stage all team members wear the same "hats". The paper presents the methodology obtained by directly transferring the methods and tools proposed for the "seven hats" method in the logic of their consistent use in conjunction with the "design thinking" technique. A table has been developed for the correspondence of the stages of creating a project idea using the "design thinking" and "seven hats" approaches, for example, the "green hat" is assigned to the "generating ideas" stage, and the "blue", "white" and "black" hats to the "prototype testing" phase. Developing the ideas of Edward de Bono, it becomes possible not only to effectively generate ideas at the stage of project initiation, but also to develop prototypes that have the value the customer needs. Namely, this is the result of a successful project activity.

Keywords*: project management; creative techniques; design thinking; the "seven hats" method; project team; idea*

Introduction

Currently, an approach that in the Russian-speaking environment is known as "flexible project management technologies" has become increasingly common. The most prominent and well-known representatives of flexible methodologies are Agile-approach [1] and Scrum methodology [2]. In fact, the agile family successfully combines many other approaches that complement each other at different stages of the project. The most complete representation of this "interaction" was created by K. Webb [3]. This model clearly demonstrates how such approaches as "Design thinking" [4], "Human centered design" [5], "Product development" [6], "Lean Approach" [7], "Dynamic System Development Method" (DSDM) [8] and even, at some points, "Waterfall Approach" with reference to the PRINCE2 standard [9]. On the other hand, it is possible that those methods that have previously demonstrated their efficiency [10], in particular, the well-known method of "Six hats" [11], are undeservedly forgotten.

The purpose of the study

To improve existing methods of teamwork at the project initiation stage by combining the most well-know nones. To compare the approaches to the organization of work at the project initial stages. The "Six Hats" method and its modification, the "Seven Hats" method [12] and the "Design-Thinking" methodology are considered as the studied methods. To propose the sharing of these
two methods to improve the efficiency of the project teams. The results can be used to develop a theoretical framework for project management at the stage of generating ideas and initiating a project.

The history of the "design thinking" technique

In [13], the author defined the design as «the process of transforming existing conditions into de-

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sirable ones». And he proposed 7 stages for such a process [14]:

1. Problem identification;
2. Research;
3. Formation of ideas;
4. Prototyping;
5. Choosing the best solution;
6. Implementation of the solution;
7. Evaluation of the results.

In the future, this work had a great influence on the emergence of the approach, which was called "Design Thinking". The most prominent representative of the methodology was the British Design School [15], interpreting Design Thinking as a creative search technology for developing products and services, distinguishing the following groups of consumers of this approach:

– Designers
– Product Managers
– Business analysts and consultants
– Teams using flexible methodologies such as Agile / Scrum
– Professionals interested in developing personal skills and organizing creative processes in a team.

Today, of course, "Design Thinking" is one of the global trends in the development of creative techniques, and, moreover, the global trend in education. According to one of the experts in "design thinking" K. Kavanaugh, "… Design thinking is a multidisciplinary approach to solving problems using prototypes in the early modeling process …". The prototype refers to products from various scrap materials that help visualize the participants' proposals [16].

The technique offered by the Stanford Design School contains five stages [17 – 19]:

1. **Empathy –** maximum immersion in the problem area. The central object of research is the person (user), his physical and emotional needs, behavior and thoughts. A user is interrogated, listened and watched.

2. **Focusing –** analysis, systematization and interpretation of the collected information. Everything heard and seen is transformed into a specific, significant, measurable and realizable task.

3. **Generation of ideas –** ideas aimed at solving the problem are generated. The main tool of this step is brainstorming. This is one of the most intensive and complex processes for the project team.

4. **Prototyping –** the most suitable ideas are selected, models (prototypes) are created for testing. Prototypes can be a variety of tools and materials: a drawing, a model made from scrap materials (cardboard, tape, a construction made of Lego elements, plasticine), furniture elements, a role-playing game or a script. The main task is to try the idea, get the initial user experience. As a rule, in the process of creating prototypes, new ideas are generated or old ones are improved.

5. **Testing –** receiving from user's information about prototypes already created, checking their performance
and validity. This stage can be called the stage of "trial and error".

As noted in [18], it is important to understand that the "design-thinking" algorithm is iterative; an idea is put forward, tested, the result is processed, and the experience is used to find an even better solution (Fig. 1).

It should be noted that this practice belongs to the category of "children's practices", which have repeatedly proved their working efficiency with an adult audience. For example, the concept of "serious games" [20], used to simulate solutions to specific business problems, or use of the popular Lego designer [21] during the initiation and planning stages of IT projects [22].

The history of the "Six hats" method

As noted in [23], among other theories of creativity, the method of the specialist in lateral thinking, Edward de Bono [24], is distinguished by youth and a certain universality. The essence of the method is described in [11] and is a technique for organizing thinking using six hats. The color of the hat determines its name:

White hat. The white color is impartial and objective. The white hat deals with thoughts mixed in numbers and facts.

Red hat. The red color symbolizes anger, rage and internal stress.

Black hat. The black color is gloomy, sinister. Black hat covers all the extreme, the negative – that can disrupt the project.

Green hat. The green color is the color of fresh foliage, abundance and fertility. The green hat symbolizes creativity, the flowering of new ideas and the normal flow of project activities.

Yellow hat. The yellow is sunny, life-affirming. The yellow hat is full of optimism, hope and positive thinking lives in it.

Blue hat. The blue color is cold, it is the color of the sky. The blue hat is associated with the organization and management of the thought process, as well as with the use of hats of the other colors.

In the process of working with various groups, the authors identified the need for introducing another hat, the orange one, into the basic model [25]:

Orange hat. The orange color is a combination of a sunny and life-affirming yellow color with an emotional red one. The orange hat fills the sense of

purpose and awareness of the value of activities for people around.

By analogy, the image of a new «hat» was proposed as the image of a classic orange construction helmet – a symbol of readiness to create something new and useful.

The following sequence of application of this already modernized set of "hats" was also proposed in group work (Table 1).

The combined use of the "seven hats" and "design thinking" methods

The logic of the process approach in "design thinking" is connected with the logic of using the modified "Seven hats" method and tested in the educational process practice [27; 28]. The authors [12] propose to use the modified method of "Seven hats" in the project team work at early project stages. Instead of applying at the consideration stage the project idea of different roles in the project team, it is proposed to approach the development of the idea step by step and at each stage all team members wear the same "hats" (Table 2).

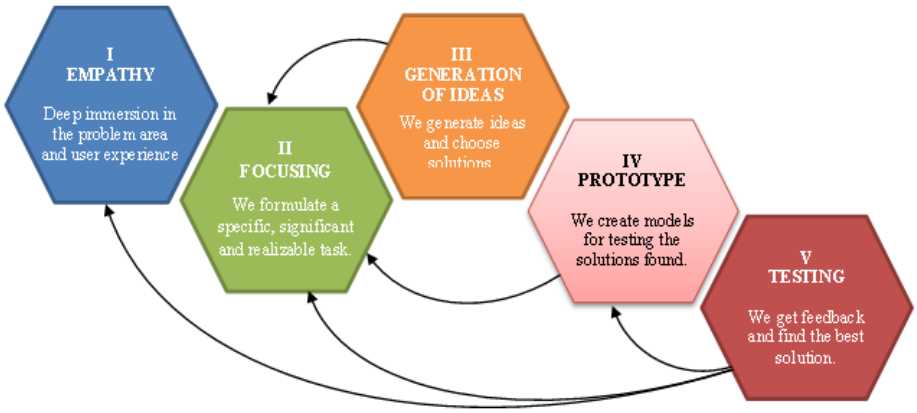

Fig.1. Iterations are the key to high-quality development of the final product

Table 1. The correspondence table of work methods and tools when generating project ideas within a specific enterprise using the "Seven Hats" method

Group work order	Type of "hat" in the advanced "Seven Hats" method	Group work tools	Group work result
1	White	SWOT analysis of the "starting position"	Description of the strengths and external capabilities of the performing organization / business development object, etc.
2	Red	Mind map	Map of business interests, personal preferences, etc. group members
3	Yellow	Stakeholder analysis	Map of potential stakeholders' interests
4	Orange (new hat)	Discussion; evaluation techniques, incl. multi-criteria ones, using "weights", etc.	The identified initiatives are «candidates» for future projects. Selected project idea for implementation (in case of deciding to implement only one project)
5	Green	Brainstorming	The project decomposition on the main intermediate results
6	Black	SWOT analysis	Description of weaknesses and threats for the selected project
7	Blue	Discussion; group discussion; analysis of work methods adopted as standard ones in a particular organization.	Selection of further tools and methods for creating a plan for a specific project / formation of a "Roadmap" of organization development projects.

Table 2. The correspondence table of work methods and tools when generating project ideas for subsequent implementation within a specific enterprise using the "Design thinking" approach

Group work order	Stage of the "design process" by G. Simon	Group work tools	Group work result
1	Problem identification	SWOT analysis of the "starting position"; formation of "users' stories"	Description of the strengths and external capabilities of the performing organization / business development object, etc.
2	Research	Surveys; focus groups; mind maps	Map of business interests, personal preferences, etc. group members, potential external stakeholders etc.
3	Formation of ideas	Stakeholders analysis; mind map	Map of potential stakeholders' interests
4	Choosing the best solution	Discussion; evaluation techniques, incl. multi-criteria ones using "weights" etc.;	The identified initiatives are «candidates» for future projects. Selected project idea for implementation (in the case of deciding on the implementation of only one project).Formed requirements for the "minimum value product"
5	Prototyping	Brainstorming; Creative work methods (using different materials); Use of "self-created" and "typical" (accessible from the external environment "elements" of the prototype being created)	Project decomposition on the main intermediate results and integration of the achieved results into the product prototype
6	Implementation of the solution	User engagement; Observation; Interviewing and survey users	Getting user feedback
7	Evaluation of the results	Discussion; Group discussion; SWOT analysis; Analysis of work methods adopted as standard in a particular organization; "Retrospective"	Description of weaknesses and threats for the selected project, Selection of further tools and methods for creating a plan for a specific project / formation of a "Roadmap" of organization development projects

This table was obtained by directly transferring the methods and tools proposed earlier for the "Seven hats" method in the logic of their consistent use. As can be seen from the comparison of Table 1 and Table 2, the main differences arise at stage 6, where it is supposed to directly test the viability of the idea by introducing (pilot operation) the created prototype ("minimum value product"). The methods and tools corresponding to stage 6 of the work, in this case, pass to the seventh final stage (Tab. 3).

Table 3. The correspondence table of project idea generation process stages using the "Design thinking" and "Seven hats" approaches

Group work order	Stage of the "design process"	Type of the "hat" in the advanced "Seven hats" method
1	**Empathy**	"Yellow" и "Red" hats
2	**Focusing**	"White" и "Orange" hats
3	**Generation of ideas**	"Green" hat
4	**Prototyping**	"Green" and "Blue" hats
5	**Testing**	"Blue", "White" and "Black" hats

Conclusions

The proposed mutual use and application of the project team work methods in its initial stages is quite promising. And, if the input logic of each participant is maximized in the process logic of the "Seven Hats" method, then the design-thinking logic has its own advantage – the stage of prototype creation and testing. The combination of these two approaches creates conditions for further enrichment of the methods and tools of project work.

By applying and developing the ideas of Edward de Bono, it becomes possible not only to effectively generate ideas at the project initiation stage, but also to develop prototypes that have the value the customer needs. Namely, this is not only the goal of such an approach as "design thinking", but also the result of a successful project activity. On the other hand, the involvement of project participants in the process of generating ideas can be the link that will allow building a reliable communication platform for the early stages of the project for high-quality work not only for Ukrainian but also for international project teams [29].

REFERENCES

1. Manifesto for Agile Software Development [Electronic resource] – Available at : http://agilemanifesto.org/ – Active link : 07.12.2017.

2. Manifesto for Agile Software Development [Electronic resource] – Available at : http://agilemanifesto.org/ – Active link : 07.12.2017.

3. The Home of Scrum [Electronic resource] – Available at : https://www.scrum.org/ – Active link : 07.12.2017.

4. Navigating the agile landscape [Electronic resource] – Available at : http://blog.deloitte.com.au/navigating-the-agile-landscape/ – Active link : 07.12.2017.

5. Design thinking as a strategy for innovation [Electronic resource] – Available at : https://www.creativityatwork.com/design-thinking-strategy-for-innovation/ – Active link : 07.12.2017.

6. What is human-centered design? [Electronic resource] – Available at : http://www.designkit.org/human-centered-design. – Active link : 07.12.2017.

7. Product development [Electronic resource] – Available at : https://www.entrepreneur.com/encyclopedia/product-development – Active link : 07.12.2017.

8. What is Lean? [Electronic resource] – Available at: https://www.lean.org/WhatsLean/ – Active link : 07.12.2017.

9. What is DSDM? [Electronic resource] – Available at: https://www.agilebusiness.org/what-is-dsdm – Active link: 07.12.2017.

10. PRINCE2® – project management [Electronic resource] – Available at : https://www.axelos.com/best-practice-solutions/prince2 – Active link : 07.12.2017.

11. Kolesnikova, E. V., Lukianov, D. V. & Sherstyuk, O. I. (2015). "Evaluation of the effectiveness of teamwork at the stage of project initiation". In Management of complex systems (Vol. 21, pp. 37-42 (in Ukraine).

12. Edward de Bono, (2006), "Six Hats of Thinking", Minsk, Belarus, *Potpourri Publ.*, 208 p.

13. Lukianov, D. V., Sherstyuk, O. I. & Gogunskii, V. D. (2014). Delo v tom, kak upravlyat' komandoy proekta vo vremya generatsii innovatsionnykh idey. [The point is how to manage the project team during the generation of innovative ideas]. In Management of complex systems. (Vol. 9, pp 101 –107) (in Rissian).

14. Herbert A. Simon. (1969). "The Sciences of the Artificial". *M.I.T. Press*, Cambridge, Mass, 130 pp.

15. Izmesteva, E. What is design thinking? [Electronic resource] – Available at : https://te-

st.ru/2015/01/28/what-is-design-thinking/ – Active link : 07.12.2017.

16. Design thinking. Creative Search Technology for Developing Products and Services [Electronic resource] – Available at : http://britishdesign.ru/courses/Design-thinking-intensiv-pro/ – Active link : 07.12.2017.

17. Design thinking : global trend in education [Electronic resource] – Available at : https://www.almau.edu.kz/news/11490 – Active link : 07.12.2017.

18. Explore the Stanford d. school [Electronic resource] – Available at : https://dschool.stanford.edu/ – Active link : 07.12.2017.

19. How to use design thinking in education [Electronic resource] – Available at : https://pedsovet.org/beta/article/kak-ispolzovat-dizajn-myslenie-v-obrazovanii – Active link : 07.12.2017.

20. Laboratory of design thinking [Electronic resource] – Available at : http://lab-w.com/ – Active link : 07.12.2017.

21. Serious games [Electronic resource] //Available at : https://geektimes.ru/company/asus/blog/261836/ – Active link : 07.12.2017.

22. The LEGO® serious play® Method [Electronic resource] – Available at : https://www.lego.com/en-us/seriousplay/the-method – Active link : 07.12.2017

23. Lego Serious Play or "managers play in models" [Electronic resource] – Available at : https://habrahabr.ru/company/scrumtrek/blog/296954/ – Active link : 07.12.2017.

24. The "Six Hats of Thinking" method by Edward de Bono [Electronic resource] – Available at : https://4brain.ru/blog/метод-шести-шляп-мышления/ – Active link: 07.12.2017.

25. Lateral thinking [Electronic resource] – Available at : 4brain.ru/tvorcheskoe-myshlenie/lateralnoe-myshlenie.php – Active link : 07.12.2017.

26. Lukianov, D. V., (2015). The "Seventh Hat" for the creative thinking method "Six Hats" by Edward de Bono". In Innovative development of the economy: entrepreneurship, education, science, pp. 239-243 (in Rissian).

27. Lukianov, D., & Vlasenko O., (2016). Process model for innovation projects ideas search. "Seven Hats" method. *In Social – Economic Development: the Role of Information and New Technologies : Monographs*, pp. 263 – 270 (in Russian).

28. Lukianov, D. V. (2013). "The use of creative techniques of thinking development in teaching project management at the university" In Managing projects in the minds of transitive economics: *Materials of the IV International Scientific Practical Conference of Magistrates, PhD students and researchers* (Vol. 2, pp.138 – 141) (in Russian).

29. Vlasenko, E. V., Lukyanov, D. V. & Gogunskii, V. D. (2013). "The model of "Diamante" is estimated in domestic communities in European projects". In Eastern-European Journal of Enterprise Technologies (Vol. 1/10 (61), pp. 86 – 88).

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ВИКОРИСТАННЯ МЕТОДІВ «ДИЗАЙН-МИСЛЕННЯ» ТА «СЕМИ КАПЕЛЮХ» НА ЕТАПІ ПРОЕКТУ ТА ПЛАНУВАННЯ

Анотація. *Стаття присвячена порівнянню інструментів аналізу інноваційних ідей, таких як «дизайн-мислення» і метод «сім капелюхів». Обидва методи застосовуються в управлінні проектами на стадії ініціації проекту. Розглянуто*

технології генерації, аналізу і вибору креативних ідей на основі поєднання цих підходів в роботі команд. Стаття є продовженням досліджень авторів в області креативного мислення. Результатом роботи є методика спільного використання методики «дизайн-мислення» і модифікованого методу Е.Боно в області професійного управління проектами, як в сфері освіти так і в сфері бізнесу. Спільне використання двох розглянутих методів дозволить не тільки підвищити ефективність роботи проектних команд, якісно генерувати ідеї на стадії ініціації проектів, а й розробляти прототипи, що володіють необхідною замовнику цінністю. А саме це є результатом успішної проектної діяльності.

Ключові слова: *управління проектами; креативні техніки; дизайн-мислення; метод «Сім капелюхів»; команда проекту; ідея*

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ИСПОЛЬЗОВАНИЕ МЕТОДОВ «ДИЗАЙНЕРСКОГО МЫШЛЕНИЯ» И «СЕМЬ ШЛЯП» НА ЭТАПЕ ИНИЦИИРОВАНИЯ И ПЛАНИРОВАНИЯ ПРОЕКТА

Аннотация. *Статья посвящена сравнению инструментов анализа инновационных идей, таких как «дизайн-мышление» и метод «семь шляп». Оба метода применяются в управлении проектами на стадии инициации проекта. Рассмотрены технологии генерации, анализа и выбора креативных идей на основе совмещения этих подходов в работе команд. Статья является продолжением исследований авторов в области креативного мышления. Результатом работы является методика совместного использования методики «дизайн-мышления» и модифицированного метода Э.Боно в области профессионального управления проектами, как в сфере образования так и в сфере бизнеса. Совместное использование двух рассмотренных методов позволит не только повысить эффективность работы проектных команд, качественно генерировать идеи на стадии инициации проектов, но и разрабатывать прототипы, обладающие необходимой заказчику ценностью. А именно это является результатом успешной проектной деятельности.*

Ключевые слова: *управление проектами; креативные техники; дизайн-мышление; метод «Семь шляп»; команда проекта; идея*