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## ОРГАНІЗАЦІЙНИЙ СУПРОВІД ЗАСТОСУВАННЯ КРАУДТЕХНОЛОГІЙ

Стаття присвячена загальним питанням організаційного супроводу краудтехнологій. Визначений вплив інституційного, динамічного підходів та підходу відносин на розвиток краудтехнологій. Розглянути переваги використання краудтехнологій в організаціях та їх вплив на корпоративне управління. Визначені сфери застосування краудтехнологій в організаціях, у т.ч. числі співвідношення краудтехнологій з аут- та інсорсинговими технологіями. Встановлені сім організаційних етапів впровадження краудсорсингу на рівні організації, у т.ч.

Етап 1. Підготовка до відкриття проєкту. На цьому етапі організація формулює замовлення, визначає умови проведення краудтехнологічного проєкту: його формат (внутрішні/ зовнішні краудтехнології), терміни, доступ учасників, вимоги до підсумкових матеріалів.

Етап 2. Залучення спільноти до проєкту. На цьому етапі компанія організовує мобілізацію та оповіщення учасників, виходячи з раніше визначених певних умов. Вона може також організувати проведення обговорення із запрошенням обмеженого кола учасників (закритої спільноти).

Етап 3. Генерація ідей/ пропозицій, обговорення співтовариством теми проєкту. У рамках цього етапу учасники розміщують ідеї щодо оголошеного проєкту, коментують версії документа, утворюючи різні майданчики дискусій.

Етап 4. Фільтрування ідей, пропозицій, версій документа. На даному етапі учасники спільноти здійснюють відбір цінних ідей/ повідомлень/ коментарів, голосують за обрані ідеї та корисність інформації, виділяють найцікавіші пропозиції із загального потоку дискусії; формують критику та спростування до поданих ідей щодо вирішення проблем.

Етап 5. Доопрацювання та розвиток ідей, пропозицій, версій документа. У рамках цього етапу учасники спільноти доопрацьовують запропоновані ідеї/ рішення/ версії документа. Учасники об'єднуються навколо ідей, що їх зацікавили, колективно допрацьовують ідеї.

Етап 6. Відбір найкращих ідей, рішень, версій документа. На завершення основної частини проєкту збирається повний перелік ідей, рішень, пропозицій, що надійшли в рамках проєкту, рішень, пропозицій авторів, у т.ч.: кращі пропозиції авторів, які отримали найбільшу підтримку співтовариства; автори, пропозиції яких набрали найбільшу кількість позитивних оцінок; кількість опублікованих пропозицій, виставлених оцінок та коментарів до пропозицій; кількість авторів, які написали пропозиції та учасників, яким був доступний проєкт. Компанія аналізує представлені за підсумками використання краудтехнологій ідеї/ рішення/ пропозиції та відбирає актуальні для впровадження. Після цього інформація про відібрані ідеї та терміни їх впровадження має бути надана керівництву.

Етап 7. Використання відібраних ідей, пропозицій, підготовка підсумкової версії документа. Організація здійснює впровадження відібраних ідей, пропозицій відповідно до

поточних планів роботи або за окремим планом. У разі, якщо проводилася експертиза внутрішнього документа, доопрацьована версія нормативного документа має бути подана на затвердження керівництву організації.

**Ключові слова:** краудтехнології, краудсорсінг, інструменти управління, менеджмент організацій.

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## ORGANIZATIONAL SUPPORT FOR CROWD TECHNOLOGIES

The article is devoted to general issues of organizational support for crowd technologies. The impact of institutional, dynamic, and relative approaches on the development of crowd technologies is identified. The advantages of using crowd technologies in organizations and their influence on corporate governance are considered. The areas of application of crowd technologies in organizations are determined, including the relationship between crowd-technologies and outsourcing technologies. There are seven organizational stages established for implementing crowd technologies at the organizational level, including 1) preparation for project launch; 2) community engagement in the project; 3) idea/proposal generation; 4) idea filtering; 5) refinement and development of ideas; 6) selection of the best ideas; and 7) implementation of the selected ideas.

**Key words:** crowd technologies, crowdsourcing, management tools, organizational management.

**The formulation of the problem.** Management of organizations that seek to become market leaders leads to changes in approaches to their management due to the influence of a number of systemic factors. Firstly, competition in the external environment of the organization is increasing. The acceleration of the transition to the information society is combined with global transformations of the economy, which leads to the emergence of advanced positions of organizations that use modern technologies, methodologies, and tools both in product manufacturing and in management. Secondly, changes are taking place at the internal level. The emergence of representatives of a new generation in the labor market forces organizations to adapt to changing forms of employee needs. The constant introduction of new technologies determines the need for the transformation of processes, staff training, management rotation, and other personnel management technologies. Thirdly, in communities of people who are dispersed in the external and internal environments of the organization, there are increasingly more opportunities for operational influence on the development of organizations, involvement in solving internal organizational tasks.

Similar problems lead to the emergence of new forms of functioning and organization management. More and more managers are beginning to use new management tools, methods, and technologies. Many of them are related to crowd technologies, which involve the use of external and/or internal resources, primarily human resources, to create additional organizational results, usually on a voluntary basis. Some organizations actively turn to crowd technologies, but there are many barriers that prevent them from doing so comprehensively, systematically, and on a large scale, due to the complexity of understanding the ways of use, the lack of regulatory framework, the conservatism of participants in management relationships, the unclear degree of possible task complexity, the boundaries of the application of crowd technologies are still undefined, and so on. As a result, crowd technologies, which not long ago were considered a universal tool for involving people in solving organization tasks, are not used in practice so often.

The need to comprehend the role of crowd technologies, clarify their essence, and develop applied aspects of their use, based on flexible principles that can determine new modern ways of

managing an organization, determine the relevance of this work.

**Analysis of recent research and publications.** The topic of crowd technologies is discussed in works by a number of key foreign and domestic scientists representing various scientific fields. The issues surrounding their use are multifaceted, which has necessitated a comprehensive study of crowd technologies.

From a theoretical point of view, crowd technologies first introduced by D. Howe have been interpreted differently by various authors, such as D. Brabham, Levy and Surowiecki, La Vecchia and Cisternino, Enrique Estellés-Arolas, Mazzola and A. Distefano, M. Vukovic, and P. Whitla. Some continue to debate the limits and boundaries of using crowd technologies, proposing alternative interpretations, such as through the term «Wikinomics», as done in the works of D. Tapscott and A. Williams. The lack of agreement also indicates insufficient understanding of the concept and its rapidly changing nature - crowd technologies are incorporating new types of organizations in new conditions and with different goals. This is why further research in this direction is extremely necessary.

Practical cases have been widely discussed in scientific works, including the analysis of individual cases of using crowd technologies in public practice by authors such as B. Noveck, T. Gylfason; in the social sphere by N. Ellison, D. Boyd, D. C. Brabham, A. Giegerich; for better event prediction by L. Wu, E. Brynjolfsson; for profit by specific corporations by K.L. Lakhani, L. Houson and N. Sakkab, A. Zynga, C. Ihl, D. Lüttgens, F. Piller. However, there is currently no clear systematization of examples of using crowd technologies.

Crowd technology is primarily addressed in domestic scientific literature by works of authors such as Y. Bolotina, N. Demchyshak, I. Dynnyk, D. Dyachkov, O. Karyi, S. Kovalchuk, A. Kudin, O. Marchenko, O. Nyshenko, K. Poltorak, A. Fomenko, and L. Shvets, who consider various practical examples of crowdsourcing, taking into account national specificities. A whole range of works by domestic authors is devoted to crowdfunding, which is directly related to crowd technology. Researchers such as V. Budarna, S. Krasnozhan, A. Rud, V. Filipova, and O. Shevchenko study crowdfunding. The issue of using crowd technology in public authorities is addressed in the works of S. Hanushchyn, O. Znatkova, O. Kireyeva, Yu. Kovbasyuk, O. Kravtsov, O. Malishenko, and others.

**The aim and tasks of the paper.** To reveal the essence of crowd technologies as a mechanism for integrating interests, a method of resource utilization, and an approach to forming organizational management structure.

**The main body of the paper and the obtained results.** At the beginning of our study, we provide the following definition of crowd technologies. Crowd technologies are tools for generating ideas, finding solutions, and implementing joint activities by a community of interested parties, based on special means and methodology of collective interaction aimed at solving tasks of varying complexity. The use of this generalized definition, in our opinion, emphasizes that the application of crowd technologies is a purposeful approach to organizing the activities of different actors, which is the essence of management. Moreover, the directions of their use in this definition are broader than other existing definitions, as we believe that crowd technologies are only in the process of formation, and their possibilities are not limited to the spheres of idea generation and solution finding.

Crowd technologies are embodied in the following areas:

a) Financial:

- crowdsponsoring;
- crowddonating;
- crowdlending;
- crowdinvesting,

b) human resources:

- crowdstaffing;
  - crowdrecruiting;
  - crowdtraining;
  - crowdhunting;
  - crowdassessment.
- c) organizational performance optimization.
- crowdmarketing
  - crowdcomputing
  - crowdstorming
  - crowdforesight
  - crowdtesting
  - crowdcreation
  - crowdwiki
  - crowdactive
  - crowdfixing
  - crowdsearching
  - crowdmapping
  - crowdsolving
  - crowdvoting.

The range of directions for using crowd technologies is impressive. For example, these technologies have enabled:

- Engaging over 70 million people in the search for creative ideas that can make the world a better place (the Pepsi Refresh Project [1]);
- Inspiring people to dedicate over 100 million hours of personal time to work on a project (Wikipedia);
- Earning over \$100 million in revenue in one year (Public Insight Network) [2];
- Saving over 100,000 human lives in one year (Institute for Healthcare) [3];
- Designing a prototype for a new generation of military equipment in just three months (the Crowd-Driven Combat Support Vehicle and UAVForge projects) [4];
- Building a model of an enzyme that destroys the HIV protein in just three weeks (FoldIt project) [5];
- Drafting a project for a new constitution (the Iceland constitution project) [6].

In this regard, let's consider the management aspects of using crowd technologies. Such analysis is important for several reasons.

Firstly, crowd technologies cannot exist without a certain group of people, and where there is a group, there is also interaction between individual individuals.

Secondly, in domestic literature, this aspect of studying crowd technologies has not yet received due attention.

Thirdly, studying crowd technologies from a management perspective can improve their organization's effectiveness, particularly by minimizing the number of failed projects.

As it is known, management is a special type of activity that transforms an unorganized crowd into an efficient, purposeful, and productive group [7]. In foreign literature, authors constantly refer to crowd technologies as a format of action of the «organized crowd». Moreover, they deserve publicity because sometimes millions of people work to create value. Thus, taking into account existing works on crowd technologies and defining management, it becomes possible to consider crowd technologies as a special method, principles of work, and instruments that transform an unorganized and unlimited crowd (which can include many more people than in a classical organization) into an effective, purposeful, and productive group, which is public by nature.

Crowd technologies are impossible without organizational activity. Any public or private

organization is a group of people whose activities are consciously coordinated to achieve a common goal or objectives. Some studies of crowd technologies already analyze this mechanism from the perspective of management, in particular, different approaches to organizing and applying crowd technologies are considered. After all, social interactions almost never form chaotically - they need help in organization [8, p. 80]. In particular, organizations need to choose the profile of participants, decide whether to create their own crowd platform or use existing solutions. Special attention should be paid to the processes of obtaining and using the obtained intellectual or other capital. At each of these stages, dozens of management decisions are required, which is why it is important to consider crowd technologies from the perspective of organization management.

The analysis of practice and existing research allows to identify the following directions of applying crowd technologies in management:

involving employees in identifying problems in organizational processes and solving them [9];

implementing various creative tasks that the organization faces with the help of interested employees [10];

collecting and organizing information and documentation in the organization's knowledge base [11];

beta testing innovative developments with the help of individual participants involved [12], and so on.

Key advantage of crowd technologies lies in the ability for organizations to implement non-core activities with the help of engaged communities of people, thereby allowing them to focus on their core functions.

According to J.M. Leimeister, any task involving the creation of value that can be transmitted in a digital environment can be accomplished through crowdsourcing. To achieve this, it is necessary to standardize, describe, and decompose the activity into indivisible components [13].

The development of any organization can be considered from various perspectives. In our case, several approaches have been selected for analysis.

Firstly, this is an institutional approach. The emergence of an organization can be explained by referring to Ronald Coase's law. According to it, a company grows as long as the cost of a new transaction within the organization is less than the cost of a transaction in the external market [14]. Thanks to the internet, transaction costs have significantly decreased, and it has become beneficial for organizations to outsource some of their activities to the external environment. The reduction in costs leads to an increase in hybrid institutional relationships. Hybrid institutional agreements are long-term contractual relationships that preserve the autonomy of the participants in the relationship, but specific transactional measures are created to prevent opportunistic actions of the parties to such agreements. Hybrid forms of agreements allow finding a smart balance between incentives and adaptation to unforeseen circumstances.

Let's move on to a more detailed analysis of hybrid forms to determine the position of crowd technologies that bring companies closer to hybrid forms. Hybrid forms of institutional relations were one of the first to be studied by Oliver Williamson. He examined relations that are within polar forms, that is, those that are neither firms nor markets. The level of asset specificity for companies determines the choice of the method of production organization. Williamson believed that the increasing costs of managing market transactions create a space for inter-firm agreements, but these do not reach the level of vertical integration, where interdependence becomes too strong and risks increase significantly [15]. Crowdsourcing significantly reduces transaction costs for companies in attracting non-market forms, reducing costs and allowing companies to avoid inter-firm relationships. In fact, companies create a market local ecosystem using crowd technologies. To understand which of the facets (firms or markets) crowdsourcing is closer to, it is necessary to analyze in more detail the various types of hybrid relationships. Oliver Williamson classified hybrid

contracts based on the level of asset specificity and transaction costs (Fig. 1).

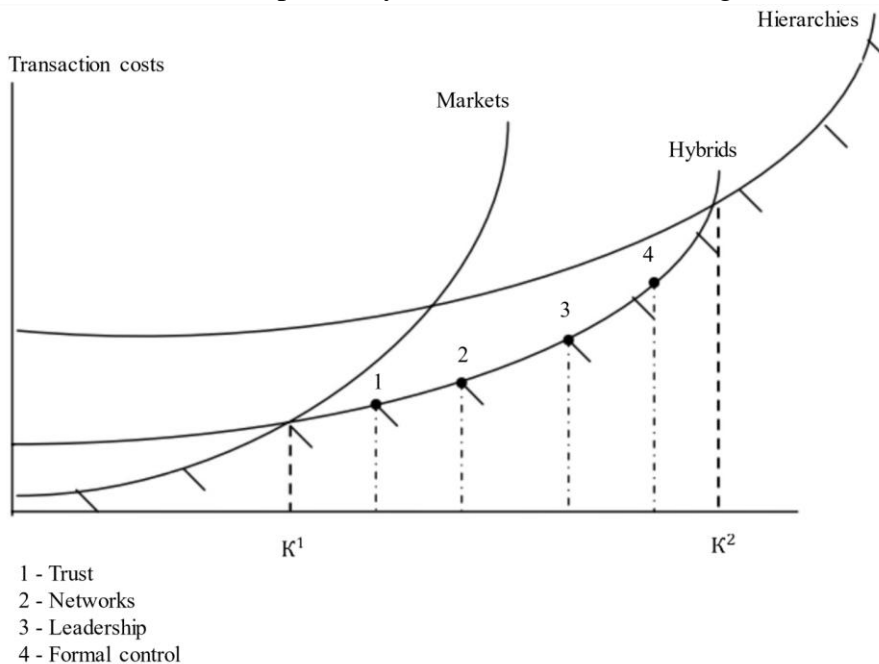


Figure 1. Typology of hybrid forms according to O. Williamson

On the diagram, it can be seen that some types of hybrids are closer to the firm, while others are closer to the market mechanism. According to Williamson, the choice of optimal structure depends on the relationship between transaction costs and asset specificity. Hybrid agreements differ in their forms of existence: some are closer to market transactions, while others are closer to internal firm relationships. Hybrids include autonomous property rights, so entities retain the right to make decisions about most assets, which distinguishes them from integrated firms. Similarly, participants in communities that use crowd technology retain autonomy. In a company, decisions are made about whether to use proposed development by participants, and participants may choose to participate or not participate in crowd structures. Participants in hybrid relationships share ownership rights over strategic resources, which require strict coordination that can be provided by the market through price mechanisms, which distinguishes hybrids from traditional market structures. Parties in hybrid agreements have the right to make independent decisions, but only in extreme cases.

Hybrid agreements resemble a coalition of interests. Indeed, hybrid structures place significant emphasis on contracts and relationships that provide considerable flexibility, but at the same time create significant risks regarding their proper execution. Sometimes organizations that use crowd technologies delegate decision-making about work to individual members of the community (such as Wikipedia), while other examples of crowd technology applications demonstrate greater autonomy of companies. Thus, crowd technologies can also take different positions regarding their proximity to companies and firms.

Thus, hybrid agreements and crowd technologies allow for a synergistic effect of using both the market and the firm. Hybrid agreements have several common characteristics:

Ownership rights remain divided, although some assets are combined;

Partners remain independent in decision-making, although some of these rights belong to their joint responsibility, which reduces autonomy.

The increasing use of crowd technologies falls under the general trend of growth in hybrid forms of institutional agreements, because the benefits of coordination and cooperation outweigh those of regular market competition, while the autonomy that firms lack provides great flexibility and incentives for the development of integrated structures. Usually, firms for which crowdsourcing is a primary production scheme are closer to the market, thus changing the image of companies.

Companies that use crowdsourcing for part of their activities organize hybrid forms of ownership in specific sectors, maintaining a greater degree of control.

Secondly, an interesting analysis from the perspective of the resource-based view, specifically its more current version - the Dynamic Resource-Based View (DRBV). This approach focuses on the changing capabilities of organizations, including the processes of forming groups of different key resources that contribute to determining strategic advantages of organizations [16]. Crowdsourcing, in this aspect, is a strategic resource possessed by organizations that utilize it.

Thirdly, the analysis of crowdsourcing is interesting from the perspective of the relational view. This approach was first defined by D. Dyer and H. Singh. It is based on the premise that relationships create rents and are a key factor in creating additional economic value [17]. If this is the case, then intra-corporate relationships between individuals, departments, or even separate companies determine the key value of the company [18]. Thus, the creation and generation of unique ideas within the framework of using crowd technologies, as well as their implementation, can form a strategic advantage over competitors.

The advantage of the symbiosis of this approaches is clearly evident in the analysis of crowd technologies. Resources can only be used effectively when there is a unique and productive interaction between key stakeholders, owners of different resources within a company, or between companies [19]. Thus, one of the key resources of an organization, viewed through the lens of a dynamic approach, is information. From a resource relations perspective, information can be used much more effectively. Organizations that are able to properly accumulate and apply relevant information draw conclusions that are not available to other market participants, and can also monetize information and ultimately become dominant in the market. Today, the information environment is changing rapidly. For example, the speed of innovation is increasing, and companies must respond with the speed of idea search and implementation, as well as adaptation and process optimization. Crowd technologies address these challenges by allowing companies to search for ideas from the external environment, engaging external resources on a temporary or permanent basis.

A similar economy in transactional communication costs would be impossible without the platform concept, according to which modern highly competitive businesses position their products not as production monolines, but as platforms that connect consumers and producers [20]. Some platforms use crowd technologies, with individual participants in the crowd technologies becoming both owners and providers, including for ecosystems where large companies such as Google open their platforms to community members.

In addition to information for organizations, the external environment is also changing. Employees increasingly want to work remotely, engage in more interesting activities, and quickly change their field of work. Crowdsourcing is capable of responding to these challenges by providing opportunities for temporary participation in individual projects and adding transparency to decision-making.

Improving decision-making efficiency is also one of the key points considered in the theory of corporate governance. Crowd technologies allow for a new direction and multiplicative effect of democratizing management in an organization, including through a more equitable distribution of ownership. Economic and socio-political reasons have influenced the transition of some management functions from classical corporate structures to company employees. An illustrative example is the German management model, in which the presence of company employees in the board of directors is enshrined in legislation, depending on the number of employees in the organization. Crowd technologies can be an additional tool to enhance the democratization effect.

Similarly, companies use crowd technologies to make strategic decisions, including in the development of their own development strategies. Thus, crowdsourcing expands the area of corporate governance to management, allowing ordinary employees who are not part of the management team to influence the strategic development of the company (Figure 2). Crowd

technologies also help to reduce hierarchy in general and make the company more flexible, giving the lower levels of management the opportunity to creatively realize themselves.

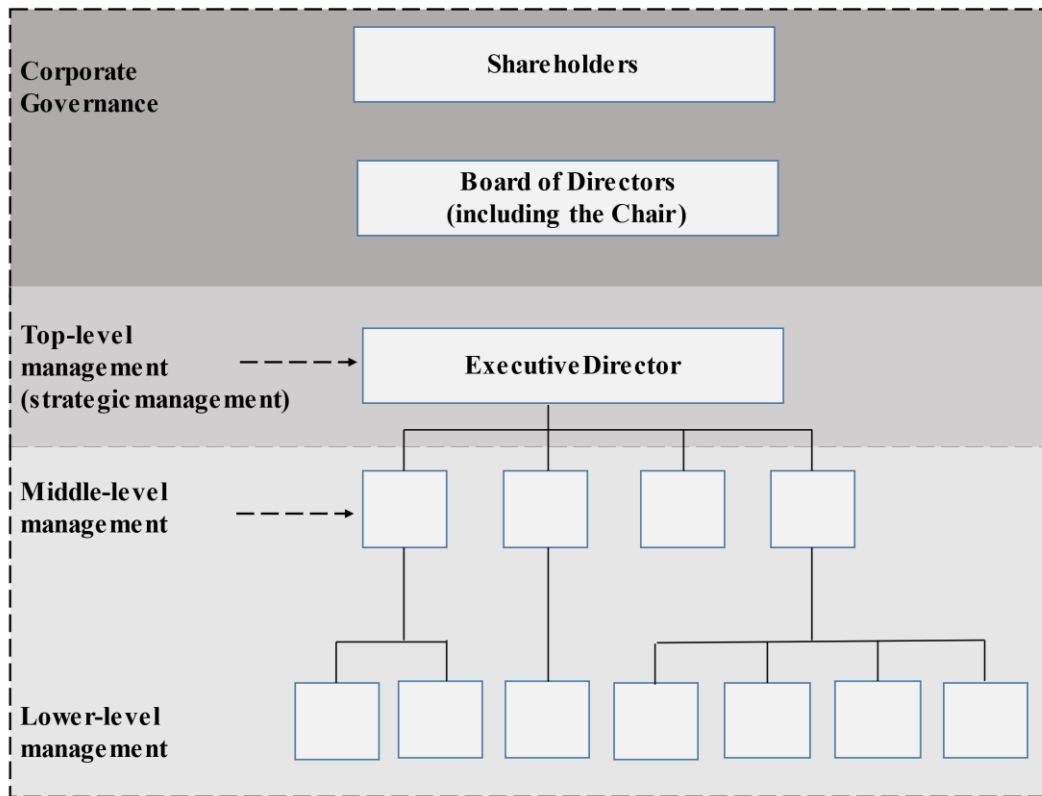


Figure 2. Expansion of the corporate governance area through the use of crowd technologies (dotted line).

Taking into account the defined features of crowd technologies, it can be concluded that their use will be justified in certain areas of organizational activity. For example, by using the criteria of «task complexity/professionalism of performers» and «task periodicity», the following matrix of areas for the use of crowds technologies in an organization can be proposed (Table 1).

Table 1

**Areas for the use of crowd technologies in an organization**

		Required level of professionalism	
		Simple, non-complex tasks that can be solved without expert involvement	Complex tasks that require expertise
Task periodicity	One-time projects	Current crowd technologies (solving one-time tasks - refining regulatory documents, product testing, writing texts, design, etc.)	Expert crowd technologies (performing complex tasks that require a non-standard approach - generating strategic recommendations for organizational development, searching for breakthrough solutions, etc.)
	Ongoing activity	Outsourcing (implementation of simple standardized functions that require professional execution outside the organization)	Insourcing (performing specific functions within the organization at expertise centers, which involves using unique skills and knowledge of participants)





forming different discussion forums. Discussions should be moderated by the project facilitator.

Stage 4. Filtering of ideas, proposals, and document versions. At this stage, community participants select valuable ideas/messages/comments, vote for chosen ideas and the usefulness of information, highlight the most interesting proposals from the overall discussion flow, form criticism and refutations of the proposed ideas for problem-solving. As a result, critical objections are formulated, weaknesses in the ideas proposed by project participants are identified, and similar ideas are selected.

Stage 5. Refinement and development of ideas, proposals, and document versions. During this stage, community participants refine proposed ideas/solutions/document versions. Participants unite around ideas that interest them, collectively refine the ideas.

Stage 6. Selection of the best ideas, solutions, and versions of the document. At the end of the main part of the project, a comprehensive list of ideas, solutions, and proposals received within the project, as well as decisions and proposals of the authors, is compiled, including:

- The best proposals of the authors that received the most community support;
- Authors whose proposals received the highest number of positive ratings;
- The number of published proposals, ratings, and comments on proposals;
- The number of authors who wrote proposals and participants who had access to the project.

The company analyzes the ideas/solutions/proposals submitted using crowd technologies and selects those that are relevant for implementation. After that, information about the selected ideas and the terms of their implementation must be provided to the management.

Stage 7. Use of selected ideas, proposals, preparation of the final version of the document. The organization implements the selected ideas and proposals according to current work plans or a separate plan. If an internal document was subject to examination, the revised version of the regulatory document must be submitted to the organization's management for approval.

**Conclusions and prospects for further research.** The potential of crowd technologies is very high, but the toolkit for its organization has not yet been fully developed. Organizations that employ a certain number of employees, provide services to numerous clients, and have an online presence can greatly improve their operations and identify prospects for further development by utilizing crowd technologies. This ultimately leads to satisfying the needs of product and service consumers. Therefore, the use of crowd technologies in organizational management requires a detailed analysis from a management perspective, including identifying its role in corporate governance across different sectors.

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