



## Emotional Behavior in the "Infodemic Vs. Panicdemic Vs. Pandemic" Modeling COVID-19

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# Emotional Behavior in the “Infodemic vs. Panicdemic vs. Pandemic” modeling COVID-19

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## Abstract

The article deals with the problems of emotional behavior in the “Infodemic vs. Panicdemic vs. Pandemic” modeling COVID-19. In the process of managing COVID-19 projects, managers try to model creative behavior and are based on creative technologies. Emotional behavior is considered as a social and psychological mechanism of transferring the mental mood of the manager to other stakeholders of the COVID-19 projects, emotional impact in the face of direct contact, and the inclusion of the individual in certain mental states that affect the effectiveness of management. The main object of modeling are simulate managers’ behaviors, educate and create new behavior in panicdemic, deadly and aggressive external conditions. In times of crisis, the emotional behavior of the project manager and his infection with the project team is exacerbated by external uncertainty. The stakeholder infection model is based on an understanding of the life cycle of the project manager, which is presented as a curve for personal changes of the manager of innovative projects and programs. Emotions are considered in content, reflecting the various aspects and meanings that caused them. To apply the psychophysiological formula for assessing the impact of the emotional state of the stakeholders of innovative projects, these influences have been transformed into a competent model “Infodemic vs. Panicdemic vs. Pandemic” COVID-19 for managing health projects. Examples of changes in the competence of the manager and the project team in the case of a wall and asthenic emotions are given.

## Keywords 1

Emotional infection, COVID-19, pandemic, infodemic, panicdemic, modeling, stakeholders

## 1. Introduction

The vast majority of human-created technologies are based on the imitation and copying of various natural processes and phenomena. Modern technologies and projects are no exception. In management processes, teams try to model the creative behavior of managers and build on the deep historical traditions of different cultures. Previously, the main subject of various innovative technologies was a separate manager or group. The task was to educate and create the organization of new behavior in adverse, deadly and turbulence external conditions. Due to the rapid development of information technologies, a new association has emerged, which is to use computer systems and networks more deeply in innovative activities: artificial intelligence systems, cloud technic, databases, big data processing and emotional intelligence [1, 2]. The trend of such penetration is growing and expanding, so there is a need for a new organization of innovative behaviors with broad involvement of information technology and management of complex system like “Infodemic vs. Panicdemic vs. Pandemic COVID-19” [14, 18].

Creatively, innovative thinking is the most valuable, open-ended part of human thinking that manifests itself in the form of certain emotions and behaviors. The health of creative thinking is a

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delicate balance between the order and the chaos of stakeholder behavior. Behavior in case of COVID-19 is often manifested through a variety of emotions. Scientific advances in this field are limited and far from complete, but at the same time, several common features inherent in this process and the behavior of innovative project managers can be distinguished. Mission is defined as the result to which the decisions of managers are directed. The goals are arranged in a certain sequence, which regulates the rational and emotional behaviors of the manager. As soon as one of them is reached, a new one arises and so on until the mission is reached. Each step towards the mission has a local purpose. Therefore, thinking can rationally organize (profile) the mission. Such an organization serves to manage actions in a complex project like managing “Infodemic vs. Panicdemic vs. Pandemic COVID-19”. Many goals and stages of their achievement are profiled in the form of a graph having the structure of a tree. The behavior of a modern project manager is organized in such a way that thinking is the cause, and action is the consequence (think first, then do it), though it is often the other way around. The peculiarity and a priori uncertainty of the innovation goal is its new quality. In turn, the innovative qualities of the purpose of the concept are relative and depend on subjective evaluation, experience, erudition, emotional intelligence, the benevolence of expertise, public recognition.

## 2. Statement of the research problem

The paper examines the model of emotional behavior of stakeholders into “Infodemic vs. Panicdemic vs. Pandemic system COVID-19” in a crisis and uncertain environment.

The purpose of the article is to formulate a model of emotional behaviors of stakeholders of complex projects and programs in a crisis and uncertainty to form rational structures and management processes in COVID-19 circumstances.

## 3. Emotional behavior into complex system with high level of uncertainty

In our environment, besides us, there are a huge number of those whom we do not see - that is. There is a certain micro-world around us. This microcosm has its own hierarchy and hierarchical structure of subordination. The one who heads the hierarchical structure forms the Risk Shell. Let's define basic term of our research.

*Pandemic* - information about the existence of a danger in society, i.e. great risk in society.

Information - activates the mind in a person and on the basis of which a decision is made.

*Infodemia* - forms public opinion about the existence of risk, about its level and consequences. Individual knowledge is formed for everyone. There is an exchange of knowledge between people and “Information Shell”, the so-called infodemia, is formed in society.

*Panic* - Disables the individual's immune system. "Infodemia" forms a “*Panikdemia*” in the society.

Public Immune System are the combining all human immunities into one.

Reason of activates individual immunity and turns on the anti-risk social immune system; or the individual's brain cannot make a decision and automatically shuts itself off. At the same time, Panic turns on and as a result; the "Panic shell of the individual" is formed.

Let's introduce some postulates for system modeling “Infodemic vs. Panicdemic vs. Pandemic COVID-19”.

The risks in society during a Pandemic are assessed taking into account the parameters of the *Public Immune System*, such as strength, power, resilience, etc. The weaker level of the «Public immune system» defines higher risk in the society.

The "public immune system" is formed on the basis of "Everyone's immune system." The more cohesive and stable the "Human immune system" defines the higher the level capacity of the "Public immune system".

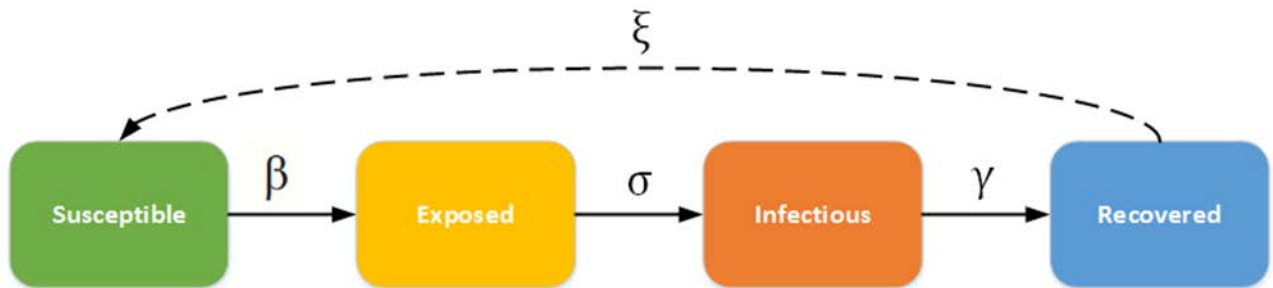
The strength and resilience of the "Public Immune System" (PIS) are reliable versus Pandemia. Increasing Panicdemic with the weak of the Public Immune System is the key threat for society.

Strength of Panicdemic versus proportional to Infodemia.

Than not correct and not extensive shell of Infodemia, the more severe Panikdemia, or vice versa.

Analytical models of infection date back to prototypes developed since the 19th century to study epidemics among humans. The transfer (more precisely, copying) of the value of this attribute from one essence of the world to another and corresponds to the infection operation with I - the type of infection like Coronavirus. Moreover, the concept of “infection” has a wide meaning.

The SEIR/SEIRS diagram below shows how individuals move through each compartment in the model. The dashed line shows how the SEIR model becomes an SEIRS (Susceptible - Exposed - Infectious - Recovered - Susceptible) model (fig. 1), where recovered people may become susceptible again (recovery does not confer lifelong immunity). The infectious rate,  $\beta$ , controls the rate of spread which represents the probability of transmitting disease between a susceptible and an infectious individual. The incubation rate  $\sigma$ , is the rate of latent individuals becoming infectious (average duration of incubation is  $1/\sigma$ ). Recovery rate,  $\gamma = 1/D$ , is determined by the average duration, D, of infection. For the SEIRS model,  $\xi$  is the rate which recovered individuals return to the susceptible statue due to loss of immunity [4].



**Figure 1:** The SEIRS (Susceptible - Exposed - Infectious - Recovered - Susceptible) model

Infodemic model infected society by truth and fakes takes place into global information space. Truth and fakes can have a positive or negative impact on the emotional status of society and projects. Infodemic processes are going faster as pandemic and interrelated between. The influence of Infodemic model to SEIRS model presented next differentiation equations.

$$\frac{dS}{dt} = -\frac{\beta SI}{N} + \omega_{\theta}(t) + p_{\theta}(t), \quad (1)$$

$$\frac{dE}{dt} = \frac{\beta SI}{N} - \sigma E + \omega_{\varepsilon}(t) + p_{\varepsilon}(t), \quad (2)$$

$$\frac{dI}{dt} = \sigma E - \gamma I + \omega_i(t) + p_i(t), \quad (3)$$

$$\frac{dR}{dt} = \gamma I + \omega_r(t) + p_r(t). \quad (4)$$

Where  $\omega_{\theta}(t)$  is the impact of Infodemic processes to susceptible population, based on the “panic”;

$\omega_{\varepsilon}(t)$  - is the impact of Infodemic processes to expose of infection, based on the decreased immunity

according to the emotional status of the population;

$\omega_i(t)$  - is the impact of Infodemic processes on infection, based on the decreased immunity according

to the emotional status of the population;

$\omega_r(t)$  - is the impact of Infodemic processes to recovered population, based on the decreased

immunity according to the emotional status.

$p_{\theta}(t)$  is the impact of Panicdem processes to susceptible population, based on the “panic”;

$P_e(t)$  - is the impact of Panicdem processes to expose of infection, based on the decreased immunity

according to the emotional status of the population;

$P_i(t)$  - is the impact of Panicdem processes on infection, based on the decreased immunity

according to the emotional status of the population;

$P_r(t)$  - is the impact of Panicdem processes to recovered population, based on the decreased immunity according to the emotional status.

In the study of the emotional behaviors of the processes of managing complex projects recognition was created by the psychophysiology PV Simonov [5] formula, in a short symbolic form represents a set of factors that affect the emergence and nature of the effects of emotions.

$$E(t) = f(P(t) * (In(t) - Is(t))), \quad (5)$$

where  $E(t)$  – emotion, its degree, quality and impact;

$P(t)$  – the power and influence of the actual need;

$(In(t) - Is(t))$  – assessment of the possibility of meeting the need based on innate and ontogenetic experience;

$In(t)$  – information on cost, meeting the need;

$Is(t)$  – information about existing assets that the manager owns.

This formula is not used to obtain specific quantitative values, but only to illustrate the very principle of the formation of positive or negative emotions of varying strength.

The factors listed above are decisive, necessary and sufficient, but a time factor should also be considered. Emotion can be either short-lived or long-lasting. At the same time, it is necessary to take into account the peculiarities of emotions and individual-typological features of managers of innovative projects. From the formula, it follows that the possibility of satisfying the need (comparing the values of IP and IT) influences the sign of emotion. A function that reflects emotions is the same as an evaluation function.

Emotional infestation is a social and psychological mechanism of transfer of mental mood to other people from one person or group of people, emotional influence in the conditions of direct contact and inclusion of a person in certain mental states.

In times of crisis, the emotional behavior of the project manager and his infection with the project team is exacerbated by external uncertainty.

Let's define:

- Pandemia (PnD) – translated from Greek means “all people”.
- Infodemia (InfD) – information coverage of “all people”, information space of society (I).
- Panicdemia (PncD) is a panic state of “the whole people”, depending on the information coverage of the society.

The more reliable (R), timely (T) and complete (C) information among the people (in society), the less panic. The absence of one of these three RTC-parameters leads to an inferior formation of “Infodemia”. In such cases, the result is an Infodemia with the “Black Hole”.

$$InfD(I) = \sum_{i=1}^I R_i T_i C_i \quad (6)$$

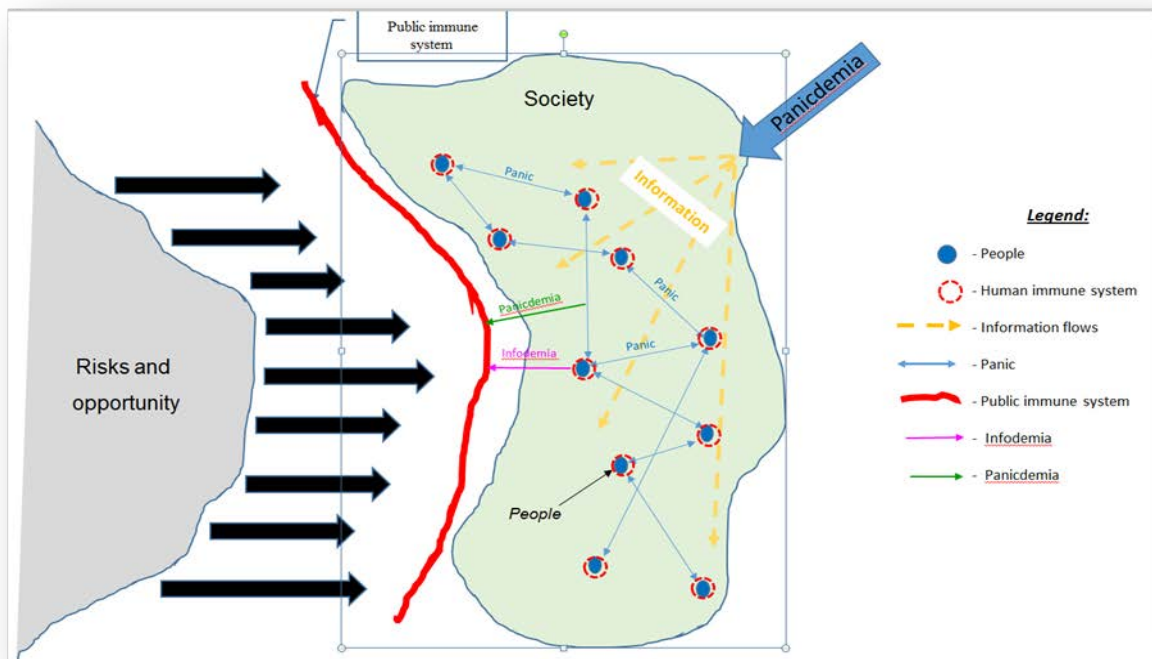
$$InfD(I) \Rightarrow PncD(I) \Rightarrow PnD(I) \quad (7)$$

$$\min(InfD) \rightarrow \max(PncD) = \max(Pnd) \quad (8)$$

$$\max(InfD) \rightarrow \min(PncD) = \min(Pnd) \quad (9)$$

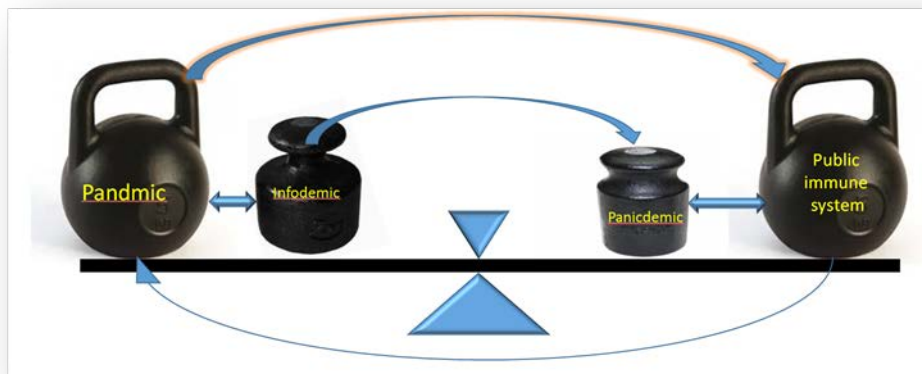
Emotions are different in content, reflecting different aspects of the complex COVID-19 project and the situations that caused those situations [9, 10].

The concept of a community project or its intellectual space emerged in the global development of management science. The project community includes members of the project team and other stakeholders, organically shapes the value of the project mission, and participates in the implementation of the project, using the combined competence of all members of the community. It is a virtual, motivational space in which the stakeholders devote themselves to the project, being in different geographical, cultural, specialized and organizational environments; and build interaction and collaboration within the project through an exchange of views on project content, planning, control and information engagement in the project. The possibility (or impossibility) of the project to create an active intellectual space significantly influences the project implementation.



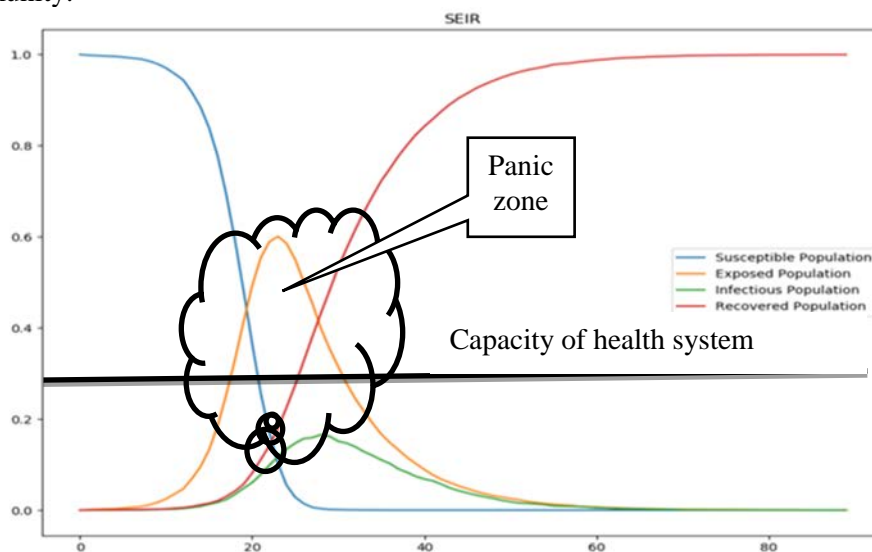
**Figure 2:** Conceptual model reaction of public immune system

Fig. 3 shows a diagram of the balance of Pandemic, Infodemic and Panicdemic COVID-19 model. The diagram shows direct and feedback links, showing the interaction logic of the proposed model.



**Figure 3:** Connection of “Infodemic vs. Panicdemic vs. Pandemic” model COVID-19

In fig. 4 shows the simulation results. On the basis of differential equations 1-4, morbidity dynamics curves are formed. At the same time, the threshold for the capabilities of the country's health care system has been determined. With an increase in the incidence and approaching the threshold of the health care system, the effect of Panicdemia arises, which sharply weakens public immunity.



**Figure 4:** Uncertainty zone and Panic of “Infodemic vs. Panicdemic vs. Pandemic” model COVID-19

A project manager is a mission-oriented professional with the necessary authority to manage uncertainty and Panic of “Infodemic vs. Panicdemic vs. Pandemic” model COVID-19 project. Its role is to detail the mission of the project on goals and objectives, to formulate a strategy for its implementation, and to form a project team consisting of experienced professionals to perform work on a project that has certain limitations and conditions for implementation.

#### **4. Case study of emotional behavior in “Infodemic vs. Panicdemic vs. Pandemic COVID -19” system**

During the implementation of the program, professionals from different fields of knowledge with different skills cooperate to achieve the mission of the program [15, 16]. The community is a space of partnership and competency, in which the professional competencies of the participants are concentrated, the competence of the team is formed, as well as the cooperation between professionals is encouraged to create a strong teamwork potential [7, 8].

At the program level, the most important thing is to set up interfaces for interaction between organizations and program team members [14].

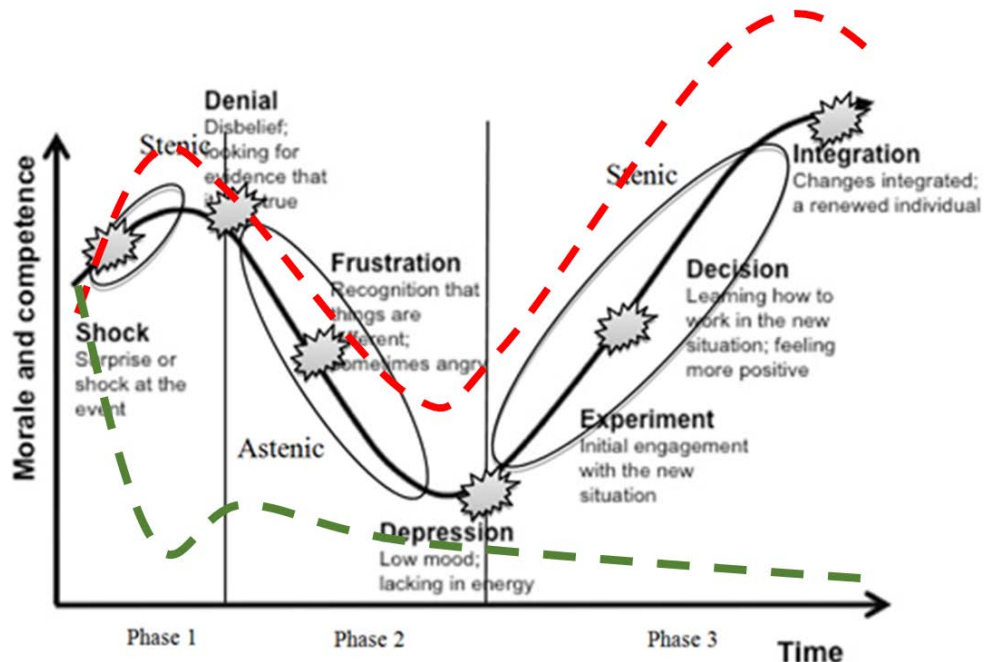
To form a harmonious community, the following rules must be followed:

- 1) strategic trust in the realization of common tasks: observance of social ethics, orientation on maybe productive cooperation and commitment in work;
- 2) defining the context and principles of the program - an unequivocal interpretation of the mission, tasks, roles and professional terms within the program;
- 3) defining the program regulations - principles of program implementation, common professional or technical language, terms for communication and standards of implementation of business processes;
- 4) the availability of professional skills that are implemented in the work on the program;
- 5) space ("Ba") is a common space used by stakeholders to support their professionalism and engagement within the program, with a minimum set of rules of engagement.

Effective community management requires visibility, usefulness and novelty. For participants to feel the usefulness of the community, it should develop and present real and clear plans for the




implementation of the program, quantitative indicators and methods of interaction. Besides, the community should be able to access the application's databases and databases at any time, from anywhere. Otherwise, it will be difficult to attract first-rate professionals to participate in the program.

The stakeholder infection model is based on an understanding of the life cycle of the project manager, which is presented as a Kubler-Ross curve for personal changes of the manager of innovative projects and programs (Fig. 5).



**Figure 5:** The curve of scope of the Infodemic vs. Panicdemic vs. Pandemic

**Where:**

-  - Infodemic critical points.
-  - Pandemic if Panicdemic is maximum,  $\text{Max}(\text{PncD})$
-  - Pandemic if Panicdemic is minimum,  $\text{Min}(\text{PncD})$

On this curve, we see the initial phase of change of effective activity within three steps - "shock, surprise, reflection", "insensitivity" and "denial". This is a short-term phase where the wall and asthenic stains are infected. These infections usually do not extend beyond the project management team. The second phase is related to a significant drop in performance. These are "blaming yourself and others," "panic and fear," "depression and danger." At this stage, an asthenic infection is formed that goes beyond the project management team [9, 10].

The third phase involves the transition from asthenic to wall infection of the stakeholders of the innovation project. In this phase, the following factors are formed - "acceptance of ignorance", "testing and verification", "feeling of optimism, hope and restart", "opening, learning", "feeling of satisfaction" and "integration and new understanding" of the innovation project [11, 12, 13].

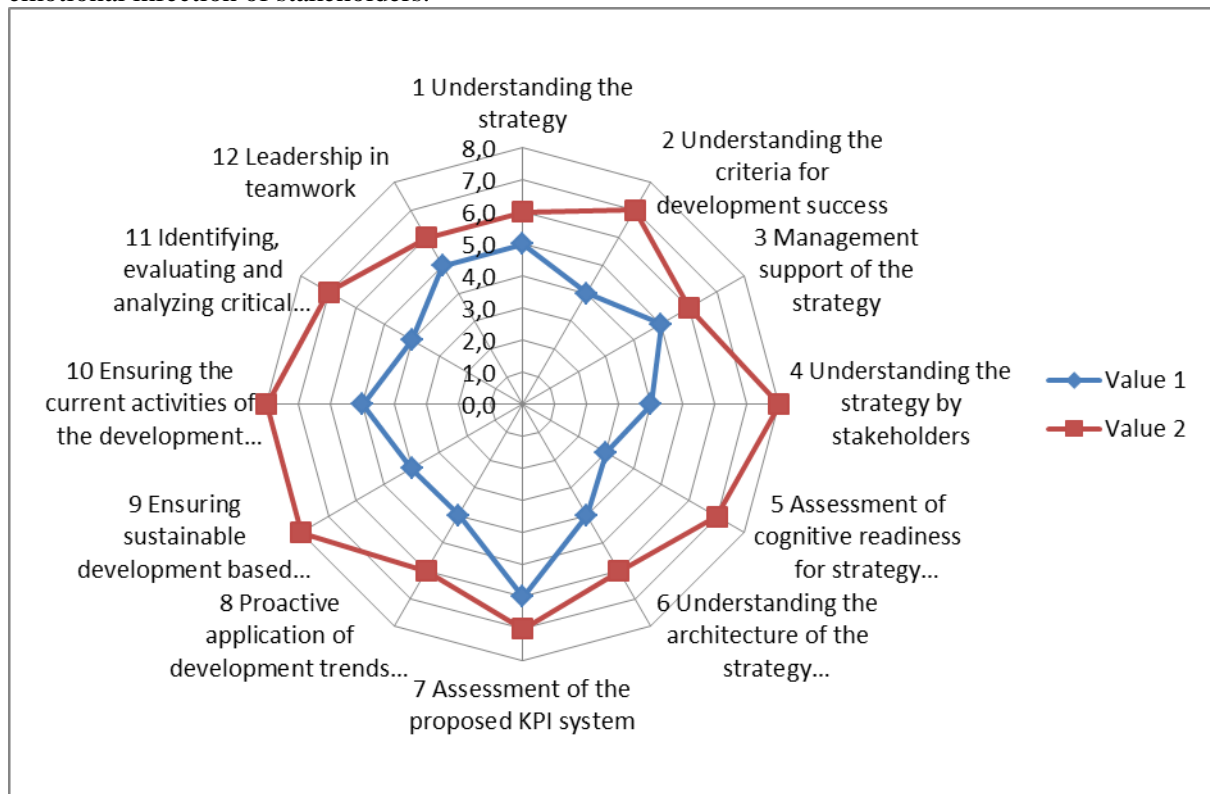
Consider how emotional infection of stakeholders in complex COVID-19 projects is formed through the competency system. Criteria for assessing competence in managing strategic trust are determined based on a taxonomy consisting of 12 criteria [3, 6]:

1. Understanding the strategy
2. Understanding the criteria for development success
3. Management support of the strategy
4. Understanding the strategy by stakeholders
5. Assessment of cognitive readiness for strategy implementation



6. Understanding the architecture of the strategy implementation program
7. Assessment of the proposed KPI system
8. Proactive application of development trends as strategy drivers
9. Ensuring sustainable development based on the principles of coherence and congruence
10. Ensuring the current activities of the development project
11. Identifying, evaluating and analyzing critical success factors for projects
12. Leadership in teamwork

The criteria evaluate: the ability to think holistically to formulate a mission in order to create added value through penetration scenarios and to determine the intention to move from an "as is" model to an "as will" model; the ability to think strategically to execute a program or project in accordance with planned success based on the organization's added value, competitive advantage, consumer satisfaction, balanced social importance, etc.; integral thinking to represent the value of the program and to support its value, developed in the beginning, against the resistance of the environment. In defining these criteria, systems of competences are formed [17], which lays the foundation for emotional infection of stakeholders.



**Figure 6:** Spider diagram for strategic trust of “Infodemic vs. Panicdemic vs. Pandemic” model COVID-19

Where

Value 1 – Panic situation in the Public health system.

Value 2 – Regular strategy according SIERS model

Key competencies for creating intelligent program support and stakeholder engagement for “Infodemic vs. Panicdemic vs. Pandemic” COVID-19 project are Strategic Thinking, Integral Thinking, Leadership, Coordination, Communication Skills (provided by information systems, databases and knowledge), as well as motivated, professional initiatives.

The results of the assessment of changes in the competence of the manager and team of the project with "asthenic emotions" are shown in Fig. 6.

The chart of changes in the level of competence of managers of innovative projects (Fig. 6) shows significant drop incompetence in the context of the influence of asthenic emotions. In this case, the

coefficient calculated as  $K = (\text{Value } 2) / (\text{Value } 1)$  in this case is equal to 1.54, which indicates the negative impact of infection on the application of the competence of the project manager.

The application of the proposed model and the approach to assessing the competencies of the manager and team of the innovation project is conceptually understandable and fully proven as to the adequacy of the model.

## CONCLUSION

The conceptual model assumes the interaction of public immunity in the framework of the mutual influence of Pandemic, Infodemic and Panicdemic in a turbulent environment.

The proposed approach to modelling the system “Infodemic vs. Panicdemic vs. Pandemic” COVID-19 involves taking into account the key factors influencing the model. This increases the adequacy of the simulation results.

The experiment conducted with the competencies of strategic trust in the situation in the country and the actions of the government showed a sharp decline in trust as a result of the Panicdemic.

## REFERENCES

- [1] S. Bushuyev, D. Bushuiev, A. Zaprivoda, J. Babayev, Ç. Elmas, Emotional infection of management infrastructure projects based on the agile transformation. CEUR Workshop Proceedings, 2020, 2565, сtp. 1–12
- [2] S. Bushuyev, D. Bushuiev, V. Bushuieva, Modelling of emotional infection to the information system management project success Advances in Intelligent Systems and Computing, 2021, 1265 AISC, сtp. 341–352
- [3] Yaroshenko F.A. Management of innovative projects and programs based on the P2M knowledge system: Monograph. // Yaroshenko F.A., Bushuyev S.D., Tanaka H. - K.: “Summit Book”, 2012. - 272 from.
- [4] S. Bushuyev, J. Babayev, D. Bushuiev, B. Kozyr, Emotional Infection of Management Innovation SMART Government Projects 2020 IEEE European Technology and Engineering Management Summit, E-TEMS 2020
- [5] Krysko V.G. Social Psychology: Lecture Course / V.G. Krysko. - 3rd ed. - M.: Omega-L, 2006. -- 352 p.
- [6] M. Todorović, D. Petrović, M. Mihić, V. Obradović, S. Bushuyev (2015). Project success analysis framework: A knowledge-based approach in project management [Text]. International Journal of Project Management. Volume 33, Issue 4, 772-783.
- [7] S. Bushuyev, N. Bushuyeva, Mechanisms of value formation in the activities of project-driven organizations, East European Journal of Advanced Technology, Kharkiv, 2010, pp.4-9
- [8] N. S. Bushuyeva, Models and methods of proactive management of organizational development programs, 2007, p.270
- [9] V. Obradović, M. Todorović, S. Bushuyev, Sustainability and agility in project management: contradictory or complementary? Springer Nature Switzerland AG, 2018
- [10] N. Rusan, S. Bushuyev, and D. Bushuyev, Emotional intelligence — the driver of the development of breakthrough competences of the project, IEEE, International Scientific and Technical Conference on Computer Sciences and Information Technologies (CSIT), Lviv, Ukraine, 2017, pp. 1-7.
- [11] S. Bushuyev, R. Wagner, IPMA Delta and IPMA Organisational Competence Baseline (OCB): New approaches in the field of project management maturity. (2014). International Journal of Managing Projects in Business
- [12] Guide to managing innovative projects and programs, P2M, Version 1.2, 2009, p.173
- [13] Individual Competence Baseline for Project, Programme & Portfolio Management, Version 4 [Text]. International Project Management Association. (2015). 415.
- [14] S. Bushuyev, D. Bushuiev, V. Bushuieva, Modelling of emotional infection to the information system management project success. Advances in Intelligent Systems and Computing, (2021), 1265 AISC, p. 341–352
- [15] C. Wolff A Structured process for transferring for academic research into innovation projects – Pimes case study / C. Wolff, B. Igel, U. Lauschner // International journal of computing. – 2014. – T. 13, № 4. – p. 227-239

- [16] O.Verenych, S.Bushuyev. Interaction researching mental spaces of movable context, stakeholder and project manager / O. Verenych, S. Bushuyev // Organization, Technology and Management in Construction: an International Journal. - 2018 (February). - Vol. #10, Issue #1, pp. 1684-1695,
- [17] S. Bushuyev, D. Bushuev, N. Bushuyeva, B. Kozyr. Information technologies for project management competences development based on global trends. Information technology and learning tools Volume 68, No 6 (2018)
- [18] A. Bondar, S. Bushuyev, V. Bushuieva, N. Bushuyeva, S. Onyshchenko. Action-Entropy Approach to Modeling of 'Infodemic-Pandemic' System on the COVID - 19 Cases CSIT 2020: Advances in Intelligent Systems and Computing V pp 890-903