Prioritization of Security Indicators at Organization of the Life Cycle of Virtual Communities

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Abstract. The article presents the classification and algorithms for determining the prioritization of virtual community life cycle organization indicators. The prioritization of indicators for the direction tasks is divided into: critical, not critical and important. The algorithms presented are necessary for quality and structured management of the virtual community. Also presented is the interface of the program "Organization of the life cycle of virtual communities". The application has the option of determining the priority of indicators in the directions of organization of the lifecycle of the virtual community.

Keywords: virtual community, life cycle, prioritizing, indicators

1 Introduction

Today, virtual communities have become one of the largest media platforms for meeting user needs. Virtual communities are widely used in various fields, including: mass media [1-3], science [4-6], medicine [7-10].

The virtual community survey metrics previously described in [11] are quantitative parameters — three required to complete tasks in the lifecycle of virtual communities. Task metrics are also used to calculate community entry into a socially-risk-averse area [12]. Documenting and tracking the dynamics of the virtual community lifecycle is an important security issue.

Prioritization is necessary to prevent socially-oriented risks in managing the community and to lose control of the community, improves the timing of the steps, because it eliminates delays in completing the tasks of the directions, and poor quality tasks are immediately rejected.

Also, prioritizing is important for correctly identifying the tasks that need to be addressed in terms of media literacy, relevance and credibility.

2 Prioritizing of indicators of directions of organization of the life cycle of virtual communities

For qualitative fulfillment of tasks of organization of life cycle of the virtual community, indicators of tasks of directions of organization of life cycle of the virtual community are introduced. For fast and qualitative fulfillment of the formulated tasks in accordance with the purpose and goals of creating a virtual community, it is necessary to determine the priority of indicators of the tasks of organizing the lifecycle of the virtual community. In order to prioritize indicators, the inputs and targets of the virtual organization of the life cycle of virtual communities tasks are required.

Comparing the input and output indicators of the virtual community lifecycle tasks allows you to determine the quality of the tasks performed in the previous stages and take into account the planned performance of the virtual community lifecycle tasks and the level of community creation.

Determining the priorities of the indicators of the organization of the lifecycle of the virtual community are divided into (fig. 1):

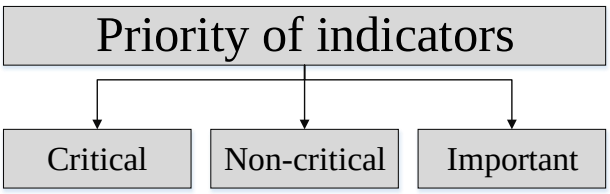

Fig. 1. Classification of prioritizing of indicators

Critical indicators of the tasks of the organization of the lifecycle of the virtual community. Indicators are critical to meeting the goals of organizing the lifecycle of a virtual community. If the inequality is not met, the tasks should be rejected.

Directions are fulfilled if the following equality is fulfilled:

$$\Delta k_i^{Dr} \le \Delta^* k_i^{Dr} \tag{1}$$

$$\Delta k_i^{Dr} = \begin{cases} 0, якщо IndP < IndI \\ \dfrac{IndP - IndI}{IndP}, IndP > IndI \end{cases} \tag{2}$$

where $\Delta^* k_i^{Dr}$ – the permissible delta set by the virtual community lifecycle manager;
$IndP$ – planned target of directing the lifecycle of the virtual community;
$IndI$ – a real indicator of the task of organizing the lifecycle of the virtual community, formed in the previous stage;
$Dr \in \{Us, Inf, Rp, Rs\}$ – user, information, reputation, and resource directions of the virtual community lifecycle, respectively.

Non-critical indicators of the tasks of directions of organization of life cycle of the virtual community. Indicators of direction tasks are non-critical for the purpose of directing the lifecycle of a virtual community.

Let ρ – scattering of relative deviations of planned and real indicators of tasks of directions of organization of life cycle of virtual community:

$$\rho = \left[\sum_{i=1}^{N} \frac{1}{N} (\Delta k_i^{Dr})^2 \right]^{1/2} \tag{3}$$

Important indicators of the task of directing the lifecycle of the virtual. The importance of an indicator of the task of organizing the lifecycle of a virtual community indicates the criticality of individual indicators. The task will only be accomplished using important metrics, others will be rejected. To determine the importance of the indicator, we use the Euclidean measure of proximity.

Important indicators of the tasks of the organization of the life cycle of virtual communities area are determined if its individual value exceeds the total scatter:

$$Ind_i^{Dr} > \rho \tag{4}$$

moreover Ind_i^{Dr} is calculated by the formula:

$$Ind_i^{Dr} = \sqrt{\sum (Ind_i^{Dr})^2 * w_i^{Dr}} \tag{5}$$

where $Ind_i^{Dr} = \begin{cases} 0, якщо IndP < IndI \\ (IndP - IndI), IndP > IndI \end{cases}$,

w_i^{Dr} – the weighting factor defined by the virtual community lifecycle manager, $0 \geq w_i \leq 1$, $W_i \in W$, $\sum_{w_i \in w} w_i = 1$;

$IndP$ – planned target of directing the lifecycle of the virtual community;

$IndI$ – a real indicator of the task of organizing the lifecycle of the virtual community, formed in the previous stage;

$Dr \in \{Us, Inf, Rp, Rs\}$ – user, information, reputation, and resource directions of the virtual community lifecycle, respectively.

3 Algorithms for determining the prioritizing of indicators of the task of organization of the life cycle of virtual communities

The algorithm for determining the critical indicators of the task of directing the lifecycle of the virtual community is designed to determine the criticality of the indi-

cator of the task of directing the lifecycle of the virtual community and the expediency of the task.

The implementation of the Critical Indicators Algorithm for the virtual community lifecycle assignment is the responsibility of the executor and the community manager, who is responsible for setting the allowable delta for determining the criticality of the indicator.

The result of performing the algorithm is to determine the criticality of the indicators and to perform the task of organizing the lifecycle of the virtual community or rejecting it (fig. 2).

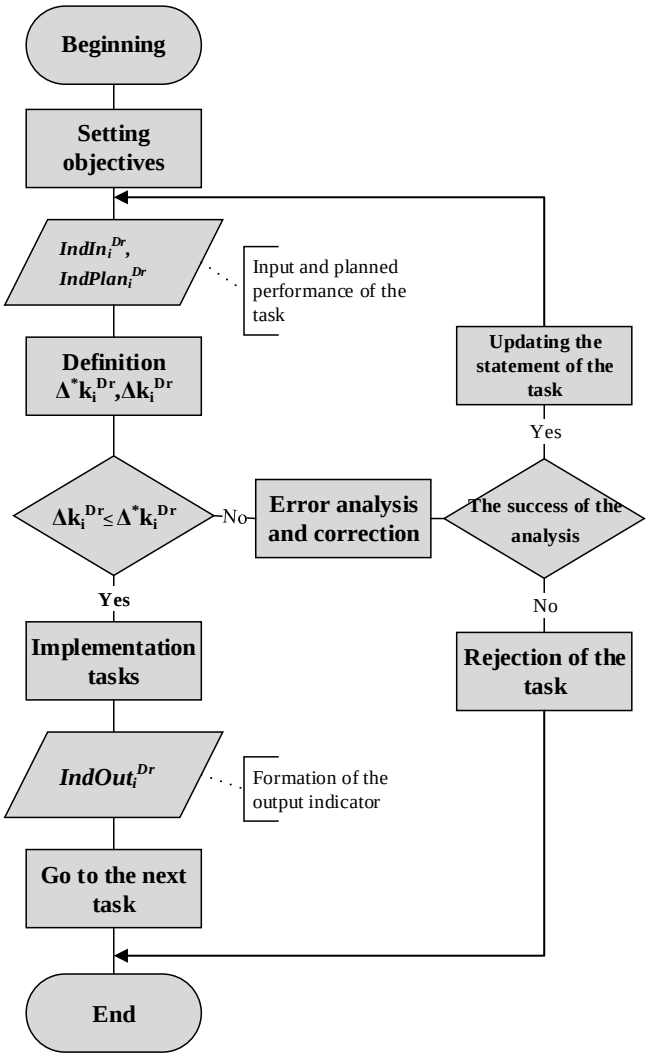

Fig. 2. An algorithm for determining the critical indicators of the task of life cycle organization

The algorithm for determining non-critical performance indices of the virtual community lifecycle has been developed to determine the non-critical performance indicator of the virtual community lifecycle and task accomplishment.
The implementation of the algorithm for determining non-critical indicators of the task of directing the organization of the lifecycle of the virtual community is the responsibility of the executor of the community and the manager of the community, which is responsible for establishing a valid delta for determining the non-criticality of the indicator.
The result of the algorithm is to determine the non-criticality of indicators and to perform the task of organizing the lifecycle of the virtual community (fig. 3).

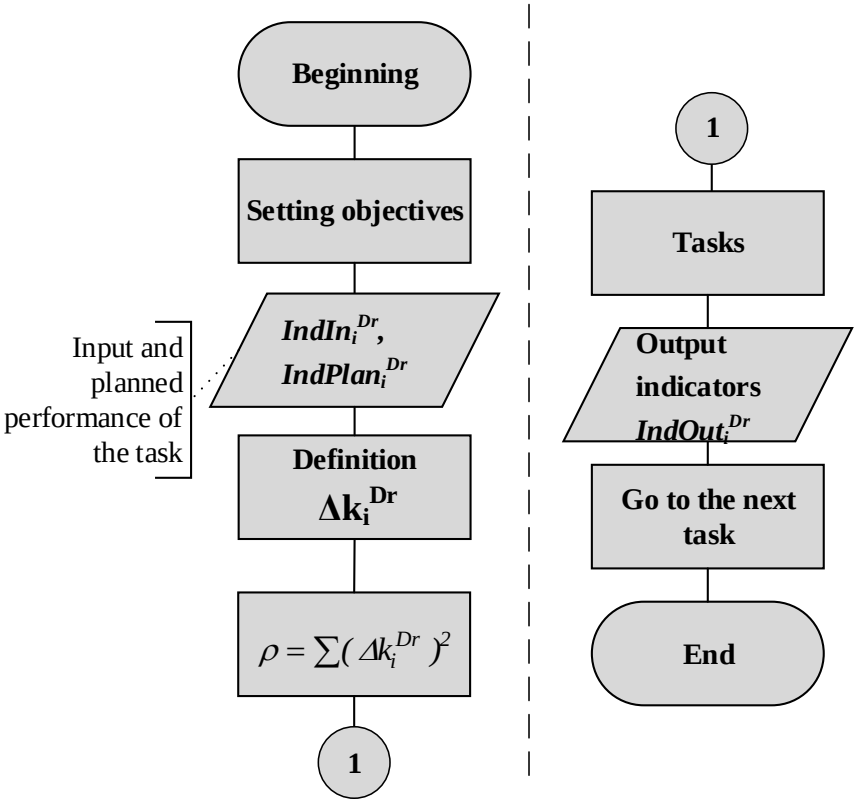

Fig. 3. An algorithm for determining non-critical indicators of the task of organizing the virtual lifecycle

The algorithm for determining the importance of indicators of the task of the organization of the lifecycle of the virtual community is designed to determine the important indicators of the task of the organization of the lifecycle of the virtual community.
The rejection of impractical indicators of the task of the organization of the lifecycle of the virtual community and to complete the task. (fig. 4).

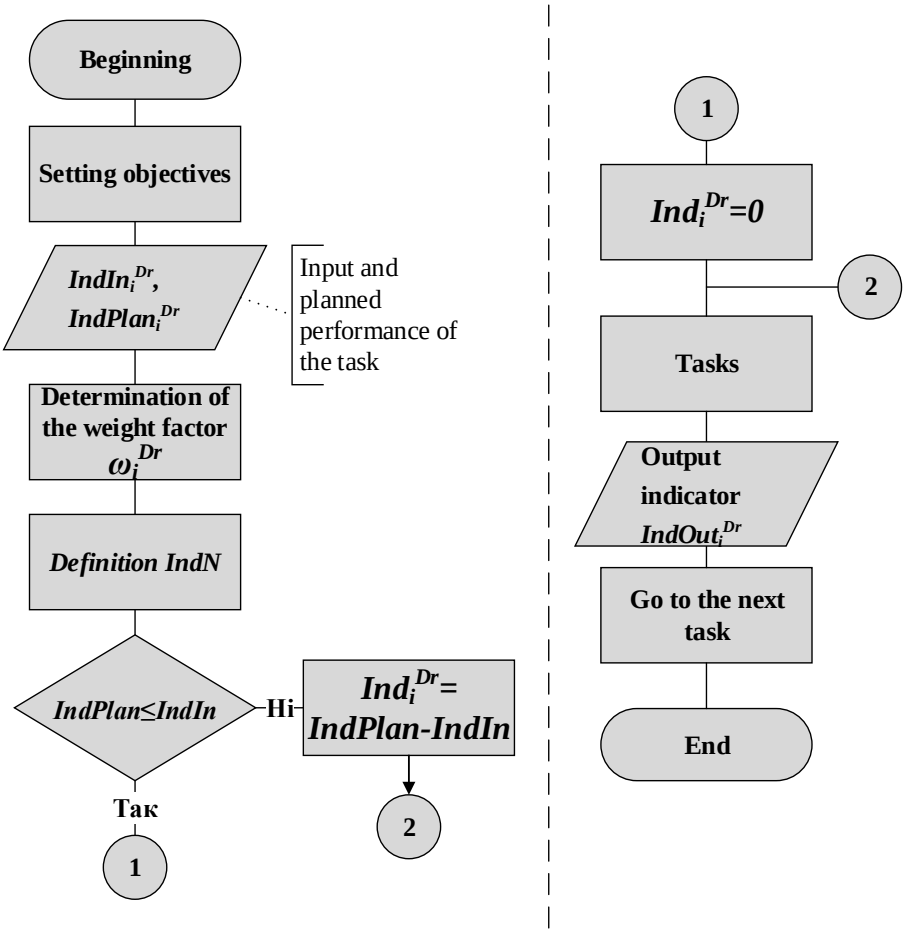

Fig. 4. An algorithm for determining important indicators of the task of organizing the lifecycle of a virtual community

The implementation of the algorithm for determining important indicators of the task of organizing the lifecycle of the virtual community is the responsibility of the executor of the community and the manager of the community, which is responsible for establishing a valid delta determination of the non-criticality of the indicator.
The result of the algorithm is to identify important indicators, rejection of impractical indicators and perform the task of organizing the lifecycle of the virtual community.

4 The user interface for the organization of the life cycle of virtual communities software application

The essence of the software-algorithmic complex show on fig. 5.

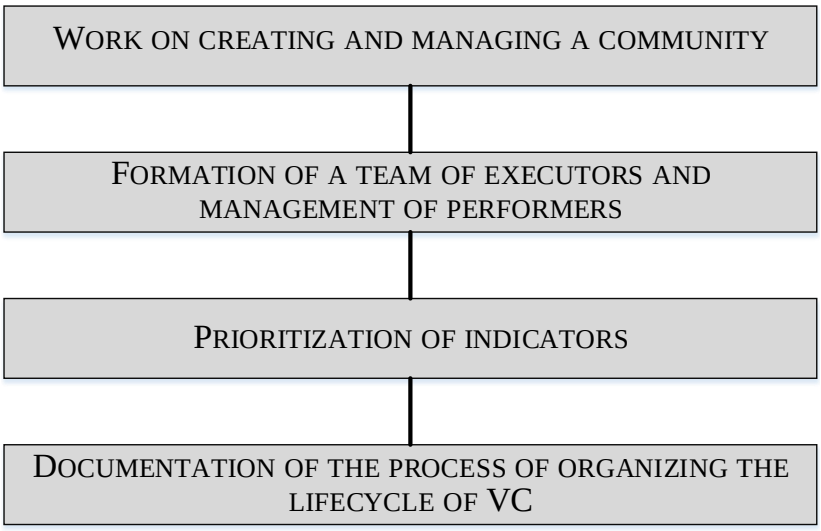

Fig. 5. The essence of the software-algorithmic complex

The user interface "Organization of the life cycle of virtual communities" is developed (fig. 6).

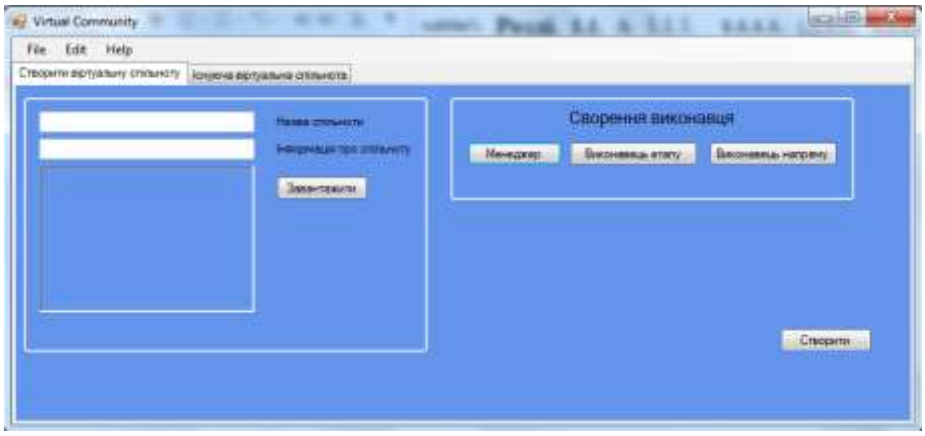

Fig. 6. The user interface "Organization of the life cycle of virtual communities"

When you create a virtual community, the primary data will be: community name, community information, and the virtual community's main highlight. The Virtual Community Manager also identifies the executors of the virtual community lifecycle organization. When defining contractors, the manager of the virtual community lifecycle organization records the contractors, which include the primary details of the burglars: surname and first name, position (specialty), telephone, email (fig. 7).

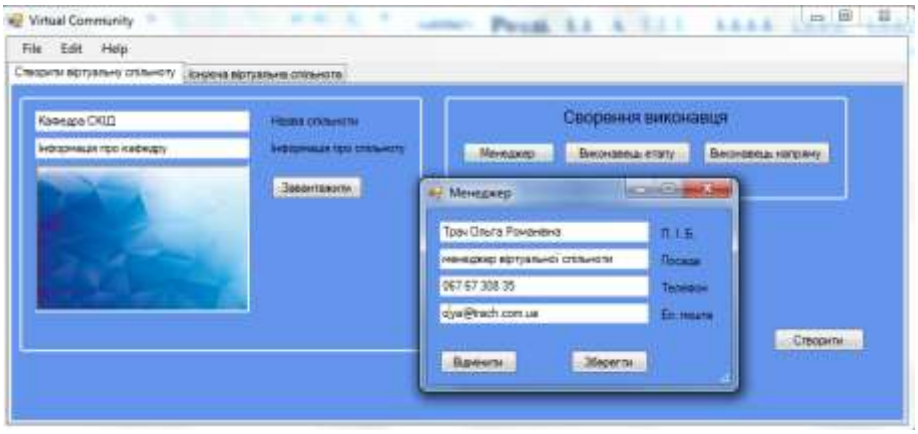

Fig. 7. The user interface "Organization of the life cycle of virtual communities"

Artist information is written to the virtual community lifecycle artist database.
According to the task of organizing the lifecycle of the virtual community, the manager chooses the direction of organizing the lifecycle of the virtual community.
Selects the appropriate contractor, and indicators of the direction of organization of the lifecycle of the virtual community, and determines the timing of the task and selects the priority of the task of organizing the lifecycle of the virtual community (figure 8).

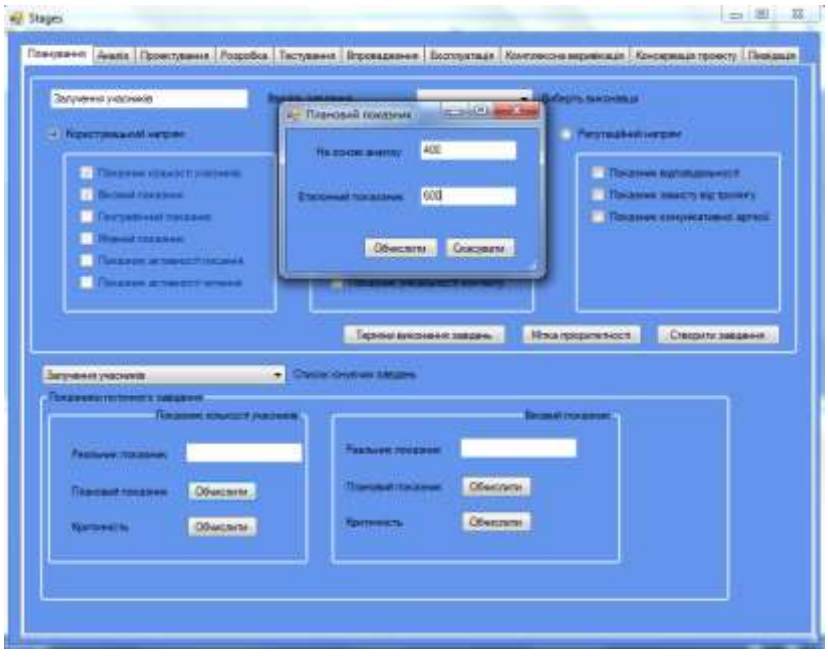

Fig. 8. The user interface "Organization of the life cycle of virtual communities"

The next step in the software “Organization of the life cycle of virtual communities” is the definition of a metric that is calculated on the basis of a benchmark and a metric based on analysis.
Important in the software “Organization of the life cycle of virtual communities” there is also a prioritization of indicators in the implementation of the objectives of the life cycle organization according to the algorithms developed in the section. This feature improves the timing of the steps, eliminating delays in the execution of direction tasks, and defective tasks are immediately rejected.
All metric results are recorded in the virtual community lifecycle database. On the basis of these data, the executors form a manager's report on the task of organizing the lifecycle of the virtual community.

Conclusion

The complex of work associated with the project activity of the virtual community has many features. Formalizing the lifecycle of a virtual community provides a better approach to the processes of planning, analyzing, developing and managing a virtual community. Measuring the prioritization of metrics allows you to manage the community in a quality way and protect your users from various threats.
Software application “Organization of the life cycle of virtual communities” assists administrators with media literacy manage the community and adhere to media hygiene practices in the virtual community.

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