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# Metric parameters of diffusion in destructive fillers automated networks

**I Surkov, G Ostapenko, V Belonozhkin and K Razinkin**

Voronezh State Technical University, Moscow ave., 14, Voronezh, 394026, Russia

E-mail: Surivan31@yandex.ru

**Abstract.** In this paper, a deep analysis was carried out and a classification of potentially destructive content and hazard metrics was obtained in an automated social network such as Instagram. The dependence effectiveness distribution of destructive content on the structural and functional specificity of a social network is determined. The classification of destructive content done in the Instagram social network allows us to determine the dependence popularity of various types destructive content on various parameters. The revealed dependence efficiency of the distribution of destructive content on the structural and functional specificity of a social network allows to design and implement the most effective organizational and technical measures to counteract the distribution of destructive content. Based on the above work, the owner of the automated network has the ability to influence the value of the network risk parameters in the context of the implementation of content wars.

## 1. Introduction

Today, problem informational influence and control (manipulation, hidden control) is particularly relevant popular and popular social networks. The greatest interest such attacks is represented by social networks, which greatly enhances psychological impact on users as objects information influence [1-3].

One most popular social networks sharing media content in Russia is a network Instagram is a free resource sharing photos and videos with elements a social network. At stage formation and development Instagram, key feature service was the opportunity for users to share with their friends' life moments using images published in the tape.

With the active growth audience and functionality Instagram, volume content circulating in network is also steadily increasing. Despite a flexible approach to issue Instagram administrators network security, research on network security from effects malicious content at moment is actual direction specialized professionals [4-6].

Alas, along with useful content user, various information (destructive content) that negatively influences users gets into network. Destructive content can be defined as any information, text documents, photos and videos that can compromise user and cause him financial damage, moral and psychological harm [7].

## 2. Identifying potential destructive content

Due to fact that content published on Instagram network is analyzed using automated algorithms, it is rather difficult to identify such destructive content. The existing approach cannot ensure the absolute



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safety of users due to active growth activity intruders and adaptation approaches to distribution malicious content to existing security algorithms.

In this regard, Instagram social network must first determine criteria assessing circulating content, analyze it and identify potentially destructive content as a tool conducting content attacks [8].

Model dressed epidemic dissemination process destructive content different from each other set of specific metrics danger tabulated each content in table 1.

**Table 1.** Specific hazard metrics identified each type destructive content on Instagram social network.

Potentially destructive Instagram content	Features affecting the distribution process	Denote Hazard Metrics
Emotional and impressive content	Emotionality	<i>Em</i>
	Prize component	<i>Priz</i>
	Involvement	<i>Soc</i>
News and trends	Relevance	<i>Akt</i>
	Informative	<i>Inf</i>
	Author's reputations	<i>Rep</i>
Contests, quests , raffles, tasks	Involvement	<i>Soc</i>
	Prize component	<i>Priz</i>
Polls	Mass character	<i>Mas</i>
Announcement of events ( paid and free)	Attractiveness	<i>Em</i>
	The correctness of the selected set of hashtags	<i>Hes</i>
Reviews and recommendations	Mass character	<i>Mas</i>
	Involvement	<i>Soc</i>
Author reviews ( including expert)	Easy to describe	<i>Pr</i>
	Informative	<i>Inf</i>
Published facts and statistics	Data objectivity	<i>Ob</i>
	Author's reputations	<i>Rp</i>

### 3. Research of hazard metrics destructive content

Next, we examine separately each hazard metrics of destructive content, reflecting a particular content feature social network Instagram:

1. *Em* – emotional, colorful and aesthetic component content. In the framework this work, *Kr* is supposed to be assessed as a relative value in comparison with most popular content at that time or another point of time:

$$\overline{Em_i(t)} = \frac{Em_i(t)}{Em_{\max}}, \quad (1)$$

where:  $\overline{Em_i(t)}$  – normalized indicator color *i*-th published content at some point in time;

$Em_i(t)$  – absolute value color index *i*-th published content, determined by aesthetic side content (number likes at some point in time);

$Em_{\max}$  – maximum value index color content published a specific topic in a certain period time in the social network Instagram (maximum number likes in a certain period).

The higher rate  $Em_i(t)$ , more emotional and impressive content is, it is very popular [8].

2. *Akt* – is an indicator relevance published content, expressed in comparing time and date publication with time and date evaluation destructive impact content:

$$Akt_i(t) = t_{\text{estimate}} - t_{\text{publ}}, \quad (2)$$

3. where:  $Akt_i(t)$  – an indicator relevance published content at some point in time;

$t_{estimate}$  – moment evaluation destructive impact content (time and date);

$t_{publ}$  – moment publication content (time and date).

The smaller figure  $Akt_i(t)$ , greater relevance published content.

4.  $Soc$  – social component published content. Such a parameter is proposed to be defined as desire an Instagram social network user to relay published content (repost). Such a relay, as a rule, is based on desire to share news, which should be interesting to subscribers user at discretion user :

$$\overline{Soc_i(t)} = \frac{Rep_i(t)}{Rep_{max}} \quad (3)$$

where:  $\overline{Soc_i(t)}$  – normalized indicator socialization  $i$ -th published content at some point in time;

$Rep_i(t)$  – absolute value number reposts  $i$ -th published content at some point in time;

$Rep_{max}$  – maximum value number reposts content a specific topic in a certain period time on the social network Instagram.

The higher value indicator  $\overline{Soc_i(t)}$ , greater social component published content, desire Instagram social network user to relay published content.

5.  $Priz$  – parameter that evaluates size prize component published content. Such a parameter will be estimated by financial value prize and normalized by a certain parameter reflecting current financial condition in terms incomes people in Russia, example, minimum wage and the subsistence minimum:

$$\overline{Priz} = \frac{Priz}{MROT}, \quad (4)$$

where:  $\overline{Priz}$  – normalized indicator prize component  $i$ -th content published at some point in time;

$Priz_i$  – absolute value prize, played out in  $i$ -th published content at some point in time (financial value prize);

$MROT$  – size minimum payment pipe at time of publication.

The higher rate  $\overline{Priz}$  greater prize component content published (financial value prize).

6.  $Pr$  – parameter that evaluates simplicity and availability published content. Such a parameter will be estimated by number characters content published relative to the optimal. The optimal number of characters can be taken from the 3 proposed options (3000, 4000, 5000 thousand characters ) depending on the subject publication:

$$\overline{Pr_i} = \frac{sim_i}{sim_{opt}}, \quad (5)$$

where:  $\overline{Pr_i}$  – normalized indicator, evaluating simplicity and availability published content;

$sim_i$  – number characters published content;

$sim_{opt}$  – optimal number characters published content.

Depending on subject matter publication, you can rate  $\overline{Pr_i}$ . The lower score, easier and more accessible it is perception Instagram users.

7.  $\overline{Real_i(t)}, \overline{Inf_i(t)}, \overline{Ob_i(t)}$  – parameters that assess realism, informativeness and objectivity published content. Such parameters can be estimated only by an expert method. For example, parameter  $Ob$  can be estimated by comparing essence published content with information from official sources. As part this work, following assessment these parameters is assumed:

$$0 < \overline{Real_i(t)}, \overline{Inf_i(t)}, \overline{Ob_i(t)} < 1, \quad (6)$$

In other words, reduction reality, objectivity and informativeness publications negatively affects process distribution destructive content.

8.  $Mas$  – is a parameter that assesses in time desire users to massively discuss subject published content. This parameter will be estimated by number comments published content and normalized by maximum number comments content a given topic [9]:

$$\overline{Mas_i(t)} = \frac{Kom_i(t)}{Kom_{\max}}, \quad (7)$$

where:  $\overline{Mas_i(t)}$  – normalized indicator mass discussion  $i$ -th published content at some point in time;

$Kom_i(t)$  – absolute value number comments  $i$ -th published content at some point in time;

$Kom_{\max}$  – maximum value number comments for a specific topic in a certain period time in the social network Instagram.

The higher rate  $\overline{Mas_i(t)}$ , more users in time  $i$  have desire to massively discuss topics published content.

9.  $Hes$  – is a parameter that evaluates correctness selected set hashtags to published content. This parameter can be estimated as position content at request a specific hashtag on Instagram social network, normalized all publications that appeared in issuance a social network this hashtag:

$$\overline{Hes_i} = \sum_{j=1}^n \frac{pos_j}{pos_{\max}}, \quad (8)$$

where:  $\overline{Hes_i}$  – normalized index evaluates to choose right set hashtags to  $i$ -th published content;

$pos_j$  – position content requested by a particular hashtag on Instagram social network;

$pos_{\max}$  – total number entries appearing in Instagram social network this hashtag;

$n$  – is a number hashtags  $i$ -th content.

The lower score, more properly selected set of hashtags to the published content [9].

10.  $Rp$  – is a parameter that evaluates reputation author publishing content. This parameter should be assessed taking into account number subscribers, number publications, as well as the average index reposts, likes and comments for all content published by the author:

$$\overline{Rp} = pod + pub + \gamma, \quad (9)$$

$$\gamma = \frac{\sum_{i=1}^n lk + \sum_{i=1}^n rep_i + \sum_{i=1}^n kom_i}{n}$$

where:  $\overline{Rp}$  – a normalized indicator that assesses level reputation author publishing the content,  $pod$  – number of subscribers author publishing content,  $pub$  – number publications author publishing content,  $\gamma$  – parameter that assesses effectiveness already existing publications (takes into account average value number reposts, likes and comments all publications author),  $lk_i$  – number likes  $i$ -th publication author,  $rep_i$  – number reposts  $i$ -th publication author,  $kom_i$  – number comments  $i$ -th publication author,  $n$  – number publications.

The higher rate  $\overline{Rp}$ , greater reputation author publishing content.

It should be noted that to obtain a more accurate distribution model destructive content each parameter, you can enter correction parameters setting weights influence one or another factor on resulting function effectiveness content wars in Instagram social network [10].

#### 4. Conclusion

Done classification potentially destructive content and hazard metrics allows implementing measures to reduce risks (automation hazard monitoring) each type. The dependence effectiveness content wars on the structural and functional specificity Instagram social network have been determined. The revealed dependence conduct of content wars on the structural and functional specificity Instagram social network allows designing and implementing the most effective organizational and technical measures to counteract content wars.

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