Evaluation Indexes of Influence and Its Application of Military-Related WeChat Official Accounts in the New Era

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Abstract. In recent years, a large number of Military-related WeChat Official Accounts (named MWOAs) have appeared, which provide a better platform for displaying the good image and transmitting the positive energy of the army. However, there are still a few tweets from these MWOAs whose quality and influence are not high enough. Based on the analysis of the influence factors of MWOAs, this paper establishes the evaluation index system of the influence of MWOAs, and proposes the method to determine the index weight. Based on these, adopting the fuzzy comprehensive evaluation method, we evaluate the actual influence of MWOAs' tweets. Compared with the actual situation, The evaluation indexes and methods we proposed have been verified to be scientific and reasonable, which provide a good reference for improving the quality and influence of MWOAs' tweets.

Keywords: Information dissemination · WeChat official accounts · Military-related accounts · Tweets influence · The Evaluation index system · Index weight

1 Introduction

With the development of new media, there are some new medias for disseminating military-related information emerging rapidly and becoming more and more popular, such as WeChat official accounts, TikTok official account, kwai account, etc. [1]. As one of typical MWOAs, it cannot be underestimated. MWOAs have an important position for military news reporting and cultural propaganda, which have the characteristics of novel presentation form, accurate delivery mode, meticulous personalized service and efficient real-time interaction. And also they provide an important platform for officers and soldiers in the military to obtain information and the public to understand military training and camp life, which not only shape and spread the new military style in the new era, but also broaden the main channels for officers and soldiers to obtain information and express their demands, for the general public to understand the army [2]. These accounts have some important contributions to the mutual understanding

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and exchanges between the military and the civilian [3]. At present, these MWOAs belong to the subscription accounts, the premise of whose dissemination depend on the users' choices [4]. Therefore, the quality and influence of MWOAs' tweets determine the number of users. However, the number of MWOAs' users is not very large, and the quality of their tweets is uneven, which restrict its influence to a certain extent [5]. It is necessary to conduct a comprehensive evaluation of their tweets' quality and influence, which achieves to improve MWOAs' influence.

2 Construction of Evaluation Index System

Based on the existing influence evaluation theories and the analysis of influence factors [6, 7], the paper constructs five first-class indicators, they are reading index, transmission power index, collection and comment index, link index and performance index [8]. As shown in Table 1, the reading index has three second-level indicators, including the number of visitors, the number of readers and the number of people watching. The transmission power index has three second- level indicators, they are sharing to friends, sending to friends and sharing to others. The collection and comment indicator has three second-level indicators, including the number of collectors, the total number of messages, and the number of comments and likes. The link index has two second-level indicators, including internal link and external link. The performance index has three second-level indicators, including graphic layout, content quality and overall layout.

The second-level indicators are divided into two categories, they are qualitative indicators and quantitative indicators. Quantitative indicators can view and count information

Table 1. Weight scores of each indicator

Index H_x	Scores	Index H_{xx}	Scores
Reading index (H_1)	27.65	the number of visitors	30.51
		the number of readers	36.08
		the number of people watching	33.41
Transmission index (H_2)	24.19	sharing to friends	35.68
		sending to friends	35.51
		sharing to others	28.81
Collection and comment index (H_3)	14.62	the number of collectors	33.89
		the total number of messages	30.65
		the number of comments and likes	35.46
Link index (H_4)	15.14	internal link	50.78
		external link	49.22
Performance index (H_5)	18.41	graphic layout	44.95
		content quality	28.24
		overall layout	26.81

via the content page pushed by the WeChat official account, which includes four indicators, such as the number of readers, the number of people watching, the total number of messages, the number of people commenting and liking. Qualitative indicators can be determined via questionnaire surveys and expert scoring, which includes another ten indicators.

3 Determination of Index Weight

The index weight is determined by the scoring of users and the questionnaire survey.

3.1 The Method of User Scoring

The weights of first-level indexes are obtained by analyzing and sorting the data, which is got from the questionnaire survey. The data of the quantitative indicators in the second-level indicators is obtained by checking the statistics of official accounts, which equals to the proportion of quantity in the highest standard multiply by 100. The qualitative indicators are not easy to quantify due to their fuzziness, so we adopt the method of scoring users who pay attention to the official accounts to judge the influence of push contents. The specific standards are as follows:

When it is not higher than the highest relative standard, we will define the quantitative indicators' score X, as equationted in Eq. (1):

$$X = {}^{AN}/_{RN} * 100 \tag{1}$$

where AN denotes the actual quantity, RN denotes the highest quantity of relative standards. When it is higher than the maximum number of relative standards, the score X will be set to 100.

It is noted that different MWOAs has different scoring standard. In this paper, the standard is based on the construction condition of a military unit's WeChat official account, so it is not applicable to other MWOAs.

The scoring criteria of a military unit is defined as follows: (1) In terms of the number of readers, they are more than 10000, between 7500 and 10000, between 5000 and 7500, between 2500 and 5000, below 2500. Corresponding to influence, they are very large, large, general, small and very small, respectively. If the full score is 100, the final score will be equaled to multiplying the proportion of the actual number of readers and the relative standard maximum number of readers by 100; (2) In terms of the number of people watching, they are more than 160, between 120 and 160, between 80 and 120, between 40 and 80, below 40; (3) In terms of the total number of messages, they are more than 40, between 30 and 40, between 20 and 30, between 10 and 20, below 10; (4) In terms of the total number of people who leave comments and like, it can be divided into five cases. They are more than 180, between 135 and 180, between 90 and 135, between 45 and 90, below 45. The corresponding influence and scoring rules of other indicators are as described in (1) above.

3.2 The Method of Questionnaire Survey

The question setting of the WeChat official account survey of a military unit is mainly divided into two parts, they are the basic situation of the respondents and the attitude to each evaluation index, respectively. In terms of the basic situation of the respondents, these questions aim at understanding whether the respondents pay attention to the WeChat official account, whether they are satisfied with the contents pushed, the average time they browse the WeChat official account every day, and the types of contents they like to browse. In terms of the attitude to each evaluation index, these questions aim at investigating the proportion of different indicators, including reading index, transmission index, collection and comment index, link index, performance index and the influence of evaluation push contents in the minds of users. The paper investigates the proportion of 14 secondary indicators. The total score in the proportion questions is set to 100, and the indicators are scored according to the user's preference, so as to collect the user's real thoughts as much as possible.

There are 74 questionnaires distributed, the number of recovered and valid are 74, respectively. The collected data is shown in Table 1 by the Eq. (1) and scoring criteria in Sect. 3.1.

By collecting users' scores on every indicator and combining the actual situation of the current WeChat official account of a military unit, the indicator weight is determined as follows: First of all, the weight of first-class indicator $W = (0.28, 0.24, 0.15, 0.15, 0.18)$. The weight of second-level indicators in reading index $W_1 = (0.31, 0.36, 0.33)$, transmission index $W_2 = (0.36, 0.35, 0.29)$, collection and comment index $W_3 = (0.34, 0.31, 0.35)$, link index $W_4 = (0.51, 0.49)$, performance index $W_5 = (0.45, 0.28, 0.27)$.

4 Application Example

In this case, we adopt the fuzzy comprehensive evaluation method [9] to caculate the influence. The specific process is as follows:

(1) Establishing evaluation factor sets and comment sets
The fuzzy evaluation factor sets are determined to be U, including above first-level indicators. The influence of MWOAs is divided into five levels named V, including very large, large, general, small, very small. In order to make the evaluation results more intuitive, we give corresponding grades and scores via using the vector $C = (c_1, c_2, c_3, c_4, c_5)^T = (100, 80, 60, 40, 20)^T$, where between 0 and 20, between 20 and 40, between 40 and 60, between 60 and 80 are corresponding to the influence as very small, small, general, large and very large, respectively.

(2) Evaluating vaguely the single factor
We survey 20 people who followed the WeChat official account of a military unit, and select a push content 'The moment hero Du Fuguo broke his arm and saluted, which moved the officers and soldiers in the army to tears' to score 10 qualitative indicators. Quantitative index data obtained by consulting the WeChat official account. A certain push content has received widely attention from many people,

the number of readers, viewers and commenters is far exceeds the maximum value of the set relative standard, so the score is 100.

(3) Establishing the evaluation model, calculating the result of evaluation
According to the theory of fuzzy comprehensive evaluation, the evaluation model of a tweet on MWOAs is as follows:

$$U = W * R \tag{2}$$

where U denotes the evaluation matrix, W denotes the first-class index weight, and R denotes the single factor evaluation set, $W = (0.28,0.24,0.15,0.15,0.18)$. According to the above scoring rules, we obtained R as follows:

$$R = \begin{bmatrix} 0.44 & 0.38 & 0.12 & 0.06 & 0 \\ 0.39 & 0.39 & 0.12 & 0.05 & 0.05 \\ 0.30 & 0.28 & 0.17 & 0.17 & 0.08 \\ 0.32 & 0.32 & 0.16 & 0.12 & 0.08 \\ 0.22 & 0.30 & 0.26 & 0.13 & 0.09 \end{bmatrix}$$

After calculation by Eq. (2), we obtained $U = (0.28,0.28,0.18,0.15,0.09)$. It is normalized to $U' = (0.29,0.29,0.18,0.15,0.09)$. The results show that 29% think that the influence is very large, 29% think that the influence is large, 18% think that the influence is general, 15% think that the influence is small, and only 9% think that the influence is small.

According to the corresponding grades given to the evaluation results, the evaluation score of the push content of the MWOA H is as follows:

$$H = U * C \tag{3}$$

where U denotes the evaluation matrix, C denotes the column vector of MWOAs' influence. According to Eq. (3) and the above data, we calculated that $H = (0.29, 0.29, 0.18, 0.15, 0.09) * (100, 80, 60, 40, 20)^T = 70.8$, which shows that it has a great influence.

5 Conclusions

The paper takes the WeChat official account of a military unit as an example, constructs the evaluation index system of MWOAs' influence, gives the method of determining the index weight, proposes the fuzzy comprehensive evaluation method to evaluate the influence, and takes a tweet as an example to evaluate its influence. Compared with the actual situation, the scientificity of the index system and the rationality of the evaluation results are verified, which provides a reference for the influence research of MWOAs.

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