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# Social Media Platform for Digital Marketing: An Analysis Using CRITIC-GRA-3N Method

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### Abstract

The objective of this article is to evaluate digital media platforms for the use of digital marketing in a computer products company using the CRITIC-GRA-3N method. Research of quantitative nature and descriptive nature evaluated different social media platforms in the light of three criteria to define which would be the best for implementing digital marketing strategies in the company under study. The results suggest that Facebook is the best alternative since it outperformed the others analyzed. With the information collected, it was possible to establish relevant reflections that bring theoretical and managerial implications regarding the theme addressed, assisting organizations in the decision-making process to choose alternatives for implementing strategies that improve their performance in the market they operate.

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### 1. Introduction

Digital marketing is a marketing strategy that has been used by organizations because it is a profitable means and has a relevant impact on business [1].

Digital marketing is a relevantly structured theme in the literature [2], even more so about marketing channels with an emphasis on digital communications, such as mobile devices, websites, search engines, emails, and social media for building long-term relationships [3].

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The term digital marketing has evolved, leaving a term more focused on products and services that use digital means, to the process of using technologies of the digital medium to win customers, retain them, create trends, leverage brands, and as well as develop sales.

In the research prepared by Tenório et al. [4], the authors sought to measure the intention of using digital marketing to leverage the performance of tourism businesses. In their research, the authors highlight that the perceived usefulness and ease of use of this type of marketing strategy are some of the factors considered critical for the adoption of digital marketing, relating positively to the performance of companies.

Given the context presented, starting from the assumptions related to the influence of digital marketing on the performance of organizations [5] and in differentiated management of digital strategies [6], this article has a guiding question: What is the best digital media platform for the use of digital marketing in a computer products company? Thus, to answer this question, this research aims to evaluate digital media platforms for the use of digital marketing in a computer products company using the CRITIC-GRA-3N method.

For this, the present article uses a robust multi-criteria decision-making method proposed by Almeida et al. [7] called CRITIC-GRA-3N [8]bb. The importance of applying multi-criteria methods in research in the area of marketing science lies in the fact that they are commonly used to assist managers in decision-making in complex and nebulous environments, providing simplification [9, 10].

Thus, the choice of this method is because it allows objective elaborating of a robust analysis that has three normalizations, as well as the combination of two different methods already well-founded in the literature[11].

The relevance of this study lies in the fact of the analysis of the main trends of digital marketing for the survival and maintenance of business for companies. Therefore, this study presents relevant contributions to the previous literature, especially by bringing an empirical study with practical analysis in marketing, in addition to the theoretical and managerial implications.

## 2. Theoretical framework

Digital marketing has become a relevant tool to leverage the competitiveness of organizations, being an efficient communication channel for prospecting customers [12], enabling increased sales revenues [13] as well as promoting the profitability of organizations [14].

Digital marketing is a technology-driven process where organizations interact with their stakeholders to communicate, distribute and sustain value to them [15]. Nassim adds that digital marketing makes use of digital technologies to promote the marketing process, to facilitate, as well as develop, a greater engagement and interaction of customers with the organization [16–18].

Santos and Moreira report that the goal of digital marketing is to reach the right consumers in real-time, with the right offers based on browsing history [19]. Thus, with the development of digital marketing and the use of social platforms, organizations can achieve more effective results in their business [20].

It is worth mentioning that social networks are known as platforms, these platforms present many connected users who can share their experiences and experiences [20, 21].

In this impetus, social media platforms tend to be relevant means for the realization of digital marketing since it presents the history of the performance of organizations which tends to generate greater reliability, experiences in the experiences of customers, and promotion of brand value [22].

In this way, using social media platforms, the organization can gain a competitive advantage, adapt to internal and external changes, as well as meet customer demands [23].

Maêda et al. [24], as well as Tenório and Gomes [25] in their studies, sought to understand the impact of the use of social media in most different departments of organizations. In their results, the authors verified that when using social media, there was a positive impact on the organization's performance, especially in minimizing costs, customer relationships, reach to information, and innovation.

Maêda and Basilio [26] suggest that small and micro business owners/managers effectively use digital marketing through social media platforms to increase e-commerce performance for sustainable growth. They

should fully utilize the popularity of using social media platforms, providing useful and reliable information about their products or services for greater customer engagement.

### 3. Methodological procedures

To achieve the outlined objective and expand the replicability of this research, a descriptive and quantitative study was developed to assist a company of computer products, making up different stages of conducting the research.

The first stage of this research began with a previous analysis of the literature to verify research gaps to define the criteria and alternatives to be analyzed. In this context, given the in-depth analysis of the literature, the criteria defined for analyzing the performance of alternatives of social media platforms for the use of digital marketing were: Cr1 – Number of users, Cr2 – Average time of use of the social network, and Cr3 – Percentage of organic media reach.

After defining the criteria, together with the manager of the organization applied to the study, four alternatives of possible social platforms were defined for the application of the organization's digital marketing strategies. Thus, it was defined that the alternatives would be A1 – Facebook, A2 – Instagram, A3 – TikTok, and A4 – WhatsApp, where this choice is justified by the fact that they are the most used in Brazil [27].

To analyze the alternatives, the method developed by Almeida et al. [7] called CRITIC-GRA-3N is implemented. This method deals with a hybrid model, which uses the multi-criteria method (CRITIC) initially proposed by Costa [28], which is a method of assigning weights to criteria belonging to the family of objective methods that take into account at the time of defining the weights the standard deviation and the conflicting character of each of the criteria, using the correlation between the indices [29].

In conjunction with the Grey Relational Analysis (GRA) method, whose main procedure is to conceive the performance of the alternatives to a sequence that is possible to compare them, called a gray relational generation [30].

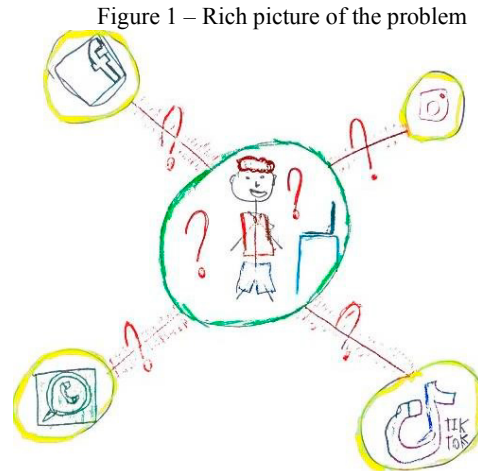
About the CRITIC-GRA-3N method, there are eight steps[7]:

- a) The decision matrix is defined;
- b) Definition of alternatives and criteria, outlining whether they are monotonic of cost or profit;
- c) The definition of weights by applying the CRITIC method;
- d) Application of the GRA method, with the weights of the criteria defined by the CRITIC method, where the first ordering is obtained;
- e) The GRA method is applied with a second normalization, also using the weights stipulated through the CRITIC, thus having a second ordering;
- f) The sum of the products of the matrix generated through the second normalization with the weights generated with the second normalization with the weights generated by the CRITIC method is performed, which generates the third ordering;
- g) The previous ordinations are normalized, with the third normalization for each of the criteria, to apply an arithmetic mean for each alternative at the end;
- h) The three ordinations are normalized, with the third ordering for each criterion, where at the end, the geometric mean is applied to each of the alternatives.

It is noteworthy that to apply the method used, the system developed by the authors was available at this link (<https://CRITIC-GRA-3N.streamlit.app/>).

#### 4. Case Study

In the search for support regarding the structuring of the problematic situation under discussion, qualitative problem-understanding techniques were used, where a rich figure was elaborated to exemplify and highlight the research problem that can be visualized in Figure 1.



The problem to be solved is the choice of the best social media platform to be implemented digital marketing strategies of a computer products company. It is a task of complex nature because it directly influences the positioning of the company in the market of this sector, as well as in the increase of customer acquisition and consequently in its performance and profit.

Thus, were defined together with the manager of the organization, three different monotonic profit criteria, and likewise four social media platforms that had prominence in the market., such as:

- Number of users: The criteria in question show the quantitative ratio of valid subscribers in each type of social network;
- Average time of use of the social network: The variable reflects a numerical quantity expressing the average, in minutes, of access per day by users of each alternative under evaluation;
- Percentage of organic media reach: A highly relevant criterion in terms of actually reaching the network's subscribers, that is, the higher the percentage, the greater the interaction and true contact between the social network and its respective audience.

All data expressed in this study concerns the dataset from Kaggle [31], where the decision matrix can be seen in Table 1.

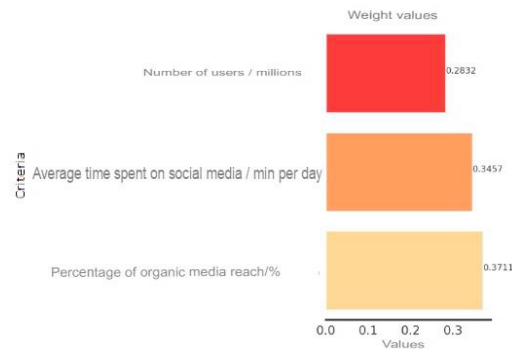
Table 1 – Decision matrix

	Cr1 - Number of users (millions)	Cr2 - Average time of use of the social network (min per day)	Cr3 - Percentage of organic media reach (%)
A1 – Facebook	116	220	6%
A2 – Instagram	122	51	10%
A3 – TikTok	73	52	29%
A4 – WhatsApp	165	60	19%

##### 4.1 Numerical Application of CRITIC-GRA-3N

Applying the aforementioned method, the objective weights of the criteria were first generated using the CRITIC method, so Figure 2 presents the weights for each of the selected criteria.

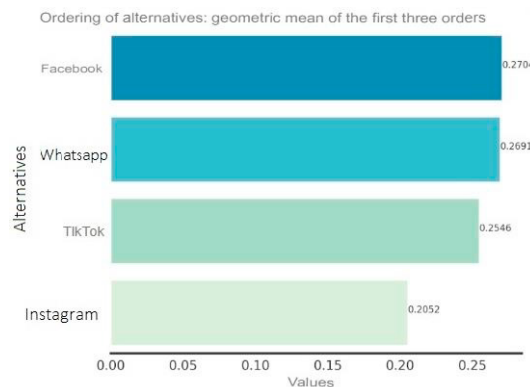
Figure 2 – Weights of the criteria



Based on Figure 2, it can be observed that the criterion with the highest weight was the. Cr3 - Percentage of organic reach of the media/%, with a weight equal to 0.3711, Cr2 - Average time of use of the social network/min per day, with a weight equal to 0.3457 in second place and finally, the criterion referring to Cr1 - Number of users/millions with a weight equal to 0.2832.

After the definition of the weights, the other steps related to the CRITIC-GRA-3N method were performed, applying the GRA method and the other normalizations that are inherent to the method used. Thus, Figure 3 presents the final ranking of the alternatives after all the steps of the CRITIC-GRA-3N method.

Figure 3 – Ranking of alternatives



It is observed through Figure 3 that the final ranking with the geometric mean of the first three orderings, the best alternative to be used as a social media platform for the implementation of digital marketing strategies for the company studied is the alternative A1 – Facebook because it obtained the best performance among the other alternatives evaluated.

#### 4.2 Discussion of Results

It was observed that the alternative with the best performance was Facebook, where through the support of the CRITIC-GRA-3N method, it was possible to establish both the weights of the criteria and the ranking of the alternatives.

Studies such as Costa et al. [32], support the findings of this research, since, in their study, with small and medium-sized companies in the Middle East, the authors were able to identify that Facebook was the dominant platform used for digital marketing purposes. It is understood that Facebook has been a social media of relevant influence in the sense of impacting the commercialization of products [33].

In addition, Santos et al. [34] denote that Facebook has features that enable greater communication between users, sharing videos, and creating groups and calendars. Still, the authors point out that the marketplace of this media assists in the marketing strategy of organizations since it makes possible the implementation of advertising and promotion of sales both individually and together, among other types of strategies.

## 5. Conclusion

This research aimed to evaluate digital media platforms for the use of digital marketing in a computer products company using the CRITIC-GRA-3N method.

The application of the method made it possible to evaluate four alternatives in the light of 3 criteria selected with the help of the manager of the organization studied. After applying the method, it was evident that Facebook is the most promising alternative for the company to adopt for the implementation of digital marketing strategies since it obtained the best performance among the other alternatives analyzed.

Given the results, it can be highlighted that the theoretical and managerial implications are raised, the theoretical ones advance the theory by demonstrating an empirical study using a robust method that can assist in the decision-making process that involves multiple criteria.

In addition, regarding the managerial implications, it can be highlighted that with the present study, business managers can use the results to establish and define the most appropriate alternative for the application of digital marketing strategies in their organization.

As a limitation of the study, it indicated the fact of using only three criteria, thus leaving a suggestion for future studies to analyze more alternatives, using more specific criteria aimed at meeting the needs of the organization to be applied.

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