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Evaluation of the impact of promotional campaign through a social networks on the key performance indicators of website for online of group-buying in Brazil

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Relevance of the study: Based on data collection and analysis, present research made it possible to identify how the activities devised by a group-buying website on Facebook may exert influence on the KPIs for success.

Purpose: The main task of present research is to answer the following question: can a digital social network be considered an effective tool for the improvement of key performance indicators (KPI) of a group-buying website?

Findings: The research was conducted by considering data collected via mechanical observation using the computational tools Facebook Dashboard and Google Analytics. Data were analyzed using the means of comparison and a Pearson correlation coefficient, which demonstrated positive results of the campaign. When compared, the key performance indicators of the web site relating to Facebook displayed a larger dynamics than the general performance indicators of this web site. By the correlation coefficient, it was found that a higher power range of the Facebook Enterprise's fan page could result in the increased traffic page hits of the examined web site, and an increase, mainly, in the number of new visitors.

Originality / value: This paper analyzes some key performance indicators of a promotional campaign on Facebook for an online group-buying website in the city of Ribeirão Preto, São Paulo State, Brazil.

Practical implications: Based on the collected data and performed analysis, it was found that the promotional activities on Facebook can increase the flow of new visitors and attract potential buyers to a group-buying website.

Future research: It is recommended to perform further research for other social networks and in other countries.

Keywords: Group-buying site; social network; web analytics; key performance indicators.

JEL Classification L81; L86; M30.

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Оцінка впливу рекламної кампанії через соціальні мережі на ключові показники ефективності веб-сайта для он-лайн групових покупок у Бразилії

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Актуальність дослідження: за допомогою збирання кількісних даних і їх аналізу поточне дослідження дозволило визначити, наскільки поведінка, ініційована веб-сторінкою групової онлайн торгівлі на Фейсбук, може впливати на ключові показники успіху.

Мета дослідження: відповісти на питання, чи можна цифрові соціальні мережі вважати ефективним інструментом для поліпшення основних показників ефективності (KPI) веб сторінок групової он-лайн торгівлі.

Результати: дослідження ґрунтується на даних, зібраних шляхом механічного спостереження із застосуванням аналітичних інструментів Фейсбук Дашборд (Facebook Dashboard) і Гугл Аналітикс (Google Analytics). Вони були проаналізовані методом порівняння середніх чисел і коефіцієнту кореляції Пірсона (Pearson correlation coefficient). Аналіз засвідчив позитивний вплив кампанії: порівняно із загальними показниками ефективності веб-сторінки показники, пов'язані із Фейсбук, виявили швидший розвиток. Кореляційний аналіз підтвердив, що сторінка прихильників підприємства на Фейсбук позитивно впливала на трафік і показник відвідування сайта, що сприяло збільшенню кількості нових відвідувачів.

Наукова новизна дослідження: у статті проаналізовано деякі показники ефективності рекламної кампанії в соціальній мережі Фейсбук для сторінки групової он-лайн торгівлі міста Рібейран-Прету, штат Сан-Паулу, Бразилія.

Практичне застосування: дані та їх аналіз допомогли довести, що рекламні кампанії на Фейсбук підвищують кількість нових користувачів і приваблюють потенційних покупців до веб-сторінки групової он-лайн торгівлі.

Напрямки майбутніх досліджень: рекомендовано проводити подальші дослідження з іншими соціальними мережами, а також в інших країнах.

Ключові слова: групова покупка на сайті; соціальна мережа; веб-аналітика; ключові показники ефективності.

Introduction

Online group-buying has become a widespread shopping method in recent years. It is a kind of social transaction model that allows a group of buyers to share needs to combine all their orders; by using group-buying, online consumers can save money on shipping fees in addition to the products themselves (*Lin, & Wu, 2015*) [1].

The online group-buying business model is based on the paradigm of change by the Internet. For *Wigand, Benjamin, & Birkland* (2008) [2], this paradigm allows any individual to explore, participate, create, or move from online communities, as well as publish contents with no need for wide technical knowledge. *Musser, & O´Reilly (2006)* [3] define this paradigm as Web 2.0.

Web 2.0 provides new opportunities of interaction and content production, the factors on which group-buying websites are actually based. These organizations are an e-commerce branch called social shopping, by combining online social networking with shopping. A distinctive feature of social commerce is its focus on supporting the social aspect of online shopping experience (*Shen, 2012*) [4]. It can be defined as a safe environment where a group is actively influential on the decision to purchase goods and services through positive and negative feedbacks, reviews, evaluations, and statements about past and present activities (*Camargo, 2011*) [5].

According to *Palmer* (2008) [6], the traffic on social shopping websites has increased by more than 500 % from mid-2007 to mid-2008, and several companies have attracted substantial financing for this online retail sector. In addition, collectively, the top 8 social networks drove 31.24 % of the overall traffic to sites in December 2014, up from 22.71 % over the same time in 2015 (*DeMers, 2015*) [7]. Based on the growing potential of value generation under this new business model, it is necessary to conduct a more comprehensive analysis of the results generated by these organizations in different markets.

Statement of the problem

The issue involving online group-buying and social media is justified by the massive presence of these websites in digital social media due to the promotions, which are mainly promoted by the visitors themselves, making these websites an important tool to sales promotion and organizational communication. In addition, the evaluation of feedback on marketing campaigns has long been a challenge for managers. Considering online campaigns, managers are able to obtain results through such computational tools as Facebook Dashboard and Google Analytics, which were extremely important in the analysis performed when preparing the present work.

Objective

The core issue of this research is to answer the following question: can a digital social network be considered an effective tool for the improvement of key performance indicators (KPI) of a group-buying website? In order to obtain possible answers, a general purpose of this research was to outline the impact of promotional campaign by a digital social network (Facebook) on KPI of a group-buying website in the city of Ribeirão Preto, São Paulo, Brazil.

Methodology

As mentioned above, the study intends to quantify the dynamics of KPIs inherent to Facebook's fan page and Google Analytics of a group-buying website. Data from both Facebook and Google Analytics were collected over the period from July 25, 2011 to October 22, 2011, and is divided into three periods for comparison: 30 days before, 30 days during, and 30 days after the campaign on Facebook. This promotional campaign consisted of the draw in which any individual that have a Facebook profile was able to participate and win a videogame device by clicking «like» on the group-buying fan page on Facebook. The campaign was effective from August 8 to September 22, 2011, and was open for public participation. The draw result was received on September 23, 2011, and the result was announced the same day.

The metrics regarding the level of compromise of visitors who interact with the group-buying fan page was obtained through Facebook Dashboard. We considered the following variables, transformed into KPI:

– «Like»: total number of new visitors who «liked» the page every day;
– «Talking about»: number of visitors who created a history about the fan page. Each value represents the total accumulated over previous seven days;
– «Total Reach»: numbers of visitors (who «like» the fan page or not) who have viewed any content (like, post, comments and shares) related to the fan page whether created by friends or the fan page itself. Each value represents the total accumulated over previous seven days;
– «Homepage View»: number of times per day the fan pages were viewed.

We also collected data from Google Analytics which, according to *Peterson* (2006) [8], can be converted into KPIs for the content and marketing websites, according to two classifications that comprise characteristics related to group-buying websites. The KPIs collected through Google Analytics are:

–   Total number of daily visits;
–   Percentage of new visits;
–   Goal completions (number of times that the page to close the deal was reached, that is, sales conversion rate).

Procedures for data analysis

By the registers made by Facebook Dashboard and Google Analytics, the means and crossed tabulation of the collected data were calculated. «Cross-tabulated data result in tables which reflect the joint distribution of two or more variables with limited number of categories or distinct values» (*Malhotra et al., 2005*) [9, p. 329].

We calculated the average rate of every variable in the three periods examined in order to confirm the existence of changes in the KPIs that can be related to the campaign on Facebook. In order to measure how Facebook KPIs are related to the dynamics of the KPIs obtained through Google Analytics, daily data of each variable from both Facebook and Google Analytics, referring to a period of 90 calendar days, and then, the Pearson product moment correlation *coefficient was calculated*. According to *Anderson, Sweeney and Williams* (2005) [10, p. 109], «the correlation coefficient is calculated by dividing the covariance of the sample by the product of the standard deviation of x by the standard deviation of y», according to the expression (eq. 1):

$$r_{xy} = \frac{S_{xy}}{SD_x \; SD_y},$$

(eq. 1)

Where: r_{xy} – sample correlation coefficient; S_{xy} – sample covarianc; SD_x – standard deviation of x; SD_y – standard deviation of y.

Anderson, Sweeney and Williams (2005) [10] also explain that the value of the Pearson correlation coefficient varies in an interval from -1 to +1: the closer to +1, there is more positive relation between the two variables, that is, the higher x, the higher y. However, the closer to -1, more negative is the relation between the two variables, so the higher x, the lower y. For *Anderson, Sweeney and Williams* (2005) [10], the closer the coefficient to 0, the lower is the relation between the variables, that is, x and y are not linearly related. For this calculation, the research applied the Excel package from Microsoft Office® software.

Results

KPI Evolution

In order to find some variation in the behavior of the defined indicators and to identify any possible impact on the campaign, the mean value of each indicator was calculated referring to 30 calendar days before, 30 days during, and 30 days after the campaign, according to Tables 1, 2, 3.

Table 1 shows an increase in all KPIs from Facebook related to the engagement of visitors, especially during the transition of the pre-campaign to the execution period (campaign). The incentive of the campaign to increase the numbers of followers of the group-buying fan page increased the daily average of new «Likes» by 18 %.

Due to the power of connection among the internet users, the reach of the fan page had a larger proportion.

It is possible to observe this variation in a larger proportion, especially by the «Total Reach» and «Talking About» KPIs, which show the number of views and interactions, respectively, with any content of the fan page over a period of every seven days.

Table 1

Evolution of Facebook KPI

Periods	25.07.2011 to 23.08.2011 Pre Campaign	24.08.2011 to 22.09.2011 Campaign	23.09.2011 to 22.10.2011 Post Campaign	Range: Pre to Campaign	Range, %	Range: Campaing to Post	Range, %	Range: Pre to Post	Range, %
Likes	154	182	55	↗	18%	↘	-70%	↘	-64%
Total reach	8217	34037	32949	↗	314%	↘	-3%	↗	301%
Page views	395	1274	876	↗	223%	↘	-31%	↗	122%
Unique visitors	144	396	653	↗	175%	↘	-11%	↗	145%
Talking about	376	1526	2947	↗	306%	↗	93%	↗	684%

Source: compiled by authors.

Table 2

KPI of Facebook collected from Google Analytics

Periods	25.07.2011 to 23.08.2011 Pre Campaign	24.08.2011 to 22.09.2011 Campaign	23.09.2011 to 22.10.2011 Post Campaign	Range: Pre to Campaign	Range, %	Range: Campaing to Post	Range, %	Range: Pre to Post	Range, %
Total number of daily visitors	466	677	462	↗	45%	↘	-32%	↘	-1%
% of new visits	12.96%	27.81%	17.18%	↗	115%	↘	-38%	↗	33%
Goal completion	18	13	8	↘	-28%	↘	-38%	↘	-56%

Source: compiled by authors.

Table 3

Google Analytics KPI: general data of access sources

Periods	25.07.2011 to 23.08.2011 Pre Campaign	24.08.2011 to 22.09.2011 Campaign	23.09.2011 to 22.10.2011 Post Campaign	Range: Pre to Campaign	Range, %	Range: Campaing to Post	Range, %	Range: Pre to Post	Range,%
Total number of daily visitors	13682	12796	9944	↘	-6%	↘	-22%	↘	-27%
% of new visits	26.66%	30.85%	25.58%	↗	16%	↘	-17%	↘	-4%
Goal completion	625	291	168	↘	-53%	↘	-42%	↘	-73%

Source: compiled by authors.

The decrease of KPIs in the post campaign period is considerable when compared to the whole period. It can be justified by the lack of a driver to motivate interactions such as the draw for some product. Furthermore, when observing the direct comparison from «before» to «after» the campaign, it is possible to consider that group-buying site reached positive results, since it increased every compromise KPI, especially «Total Reach» and «Talking About». Although the mean value of new «Likes» per day decreased, the group-buying site still increased the quantity of followers even though by a slower pattern.

Table 2 shows that the campaign had direct and positive impact on the two KPIs indicated by *Peterson* (*2006*) [8]: the «Total Number of Daily Visits» and the «Percentage of New Visits». From the pre-campaign to its execution, there was a considerable growth of these indicators (by 45 % and 115 %, respectively), which was not repeated in the subsequent period. However, when analyzing a comparison between «before» and «after» the campaign, it is possible to notice a slight decrease in the «Total Number of Visits», and the growth in «Percentage of New Visits». Possibly, new customers are being attracted to the website.

Regarding the KPI «Goal Completion», related to the numbers of visiting the page of purchase ending, it is noticed there is no growing line depending on the dynamics of the compromise KPIs from Facebook.

This scenario suggests that the power of conversion of sales visits is not exclusively related to the source of access or to the level of interaction with visitors. There are other factors to determine the capacity of conversion in sales, such as offers (since group-buying sites do not have a pre-defined portfolio of products, services or suppliers), market variation (retraction or expansion), seasonality, and demand flexibility.

Table 3 shows that only «Percentage of New Visits» general KPI of the group-buying site (resulting from the sum of all accesses sources, including Facebook) indicated growth. This KPI also presented the biggest growth in the analysis of accesses KPIs originated exclusively by Facebook (Table 2).

It indicates that new Facebook visitors boosted the growth of new visits to the group-buying site. Concerning data from Tables 2 and 3, it is possible to observe that, in the comparison between the periods «before» and «after» the campaign (results accumulated in 90 days), the KPIs originated exclusively by the Facebook displayed better results than the KPIs originated by the sum of all sources of access to group-buying website. In a supposed context contrary to the growing, the campaign on Facebook made its access KPIs stand out over the general ones.

Correlation Facebook versus Google Analytics KPIs

A s previously mentioned, we adopted the Pearson correlation coefficient, which, according to *Malhotra (2005)* [9, p. 365], «is an index used to determine whether there is a linear relation or non-linear relation between X and Y». Table 4 depicts a correlation between Facebook and Google Analytics KPI. The «Likes» index in the 90-day period, a positive relation was found concerning the dynamics of the three KPIs defined in the same period.

Table 4

Facebook versus Google Analytics KPI

	Likes	Total Reach	Fan Page Views	Unique Visitors	Talking About
Total Number of Visits	0,153510058	0,269292743	0,142965997	0,178136765	-0,008813276
% of new Visits	0,035366025	0,411102427	0,028241483	0,088392056	0,176952731
Goal Completions	0,228215786	-0,361140517	-0,131782921	-0,155684803	-0,306260567

Source: compiled by authors.

A major relation observed was between «Total Number of Visits» and «Goal Completion». Although the relation is not so strong or close to +1, once it is positive, it is possible to suppose that the more «Like» options the group-buying site has, the better the results of the KPIs studied.

As for the negative relation to the «Goal Completion» KPI, it is not possible to guarantee that such indexes have opposite numbers, because conversions of purchases depend on many other factors inherent to the market such as price, quality of sponsorship, seasonality, website effectiveness, etc.) (*McDowell, Wilson, & Kile, 2016; Wang, Wang, & Liu, 2016*) [11; 12].

Although weak, the «Fan Page Views» KPI is positively related to the «Total Number of Views» of the group-buying site and to its «Percentage of New Visits», which is almost irrelevant (+0.02), i.e., there is no linear relation. As for the «Total Number of Visits to the group-buying site homepage, it is supposed that they increase with the growth of times the fan page on Facebook is visited, accordingly.

The index «Unique Visitors» to the fan page of the group-buying site on Facebook, even with a low intensity, is positively related to the «Total Number of Visits» and to the «Percentage of new Visits». Thereby, this suggest that the more visits to the fan page on Facebook will possibly increase the «Total of Visits» and the «Percentage of New Visits», the latter with a low intensity index, in a tendency to a non-linear relation (+0.08).

Finally, the «Talking About» KPI positively relates only to the «Percentage of New Visits». In this way, the higher the number of people making comments, liking or sharing contents, the higher the number of new visits. As for relation of the index «Talking About» with the «Total Number of Visits» it can be considered zero, due to its very low intensity (-0,008), resulting in a virtually non-linear relation.

Conclusions

T hrough data gathering and analysis, the present research allowed us to identify how the activities developed by a group-buying website on Facebook may have an impact on the KPIs for success.

Based on the idea that companies of any segment at present have to be cautious about their reputation on the web and also promote themselves by using the web, this paper assumes that an online company, actively acting on social networks, may reach positive results as long as they are aligned with actions. In order to reach specific objectives and based on a theoretical referential, this work was an attempt to make a quantitative register on how Facebook relates to some of the more important indicators of a group-buying website.

We analyzed results from periods before, during and after campaign aimed at increasing the number of followers of the company's fan page on Facebook. Concerning the KPIs, it was observed that the campaign achieved positive results, especially during the period it was activated, because customers were apparently more interested in interacting with the fan page and participating in the draw. In general, analysis over 90 days verified effective and positive impact of the activity, that is, web users were still loyal to the company even after the draw result was announced.

As for the KPIs of the group-buying website defined for this work, those not originated directly and exclusively by Facebook, were positively affected by the activity, given the growth by 45 % of the total number of visits and by 115 % of new visits to the group-buying site in the transition period from the pre-campaign to its execution (Table 2). For a website, which intends to improve its power of range, to increase the number of registers and to attract more prospective consumers, this type of activity is very efficient. A period after the campaign demonstrates the reduction of all indicators when compared to the period the campaign was activated, which can be justified by the lack of a driver to motivate visitors. However, between «before» and «after», we registered a growth by 33 % in new visits to the group-buying site and a decrease by only 1 % in the total visits (Table 2), thus confirming the efficiency of such type of activity for the consequent and possible new registrations and consumers.

At the same time, the research registered that KPIs originated from every access source of the group-buying site, that is, the general data of the website compared to those originated by Facebook itself. Then, a retraction bias of the three KPIs in general was identified, with a decrease by 27 % in the total number of visits, 4 % for new visits and 73 % for goal conclusions in the comparison between before and after the campaign (Table 3). As for the relation to the KPIs originated by the Facebook, we noticed less sharp drops, at -1 % for the total number of visits and at -56 % for goal conclusions, and also a growth by 33 % in new visits (Table 2). This scenario reveals that, in the context of retraction bias demonstrated over the examined period, the activity on Facebook contributed for its indicators to have results above the general indicators of the group-buying site.

This work also intended to establish how Facebook indexes relate to some of the main KPIs through an analysis of correlation coefficients. It was verified that the «Like» index is positively related, which may indicate that the more followers of the fan page, the bigger the number of people to achieve the purchase conclusion page of the group-buying site, and the contrary can be stated, also.

Another highlight was the positive relation of +0.41 between the «Total Reach» and the «New Visits» KPIs, which suggests that the more number of visitors attracted by the content of the fan page on Facebook, the bigger is the percentage of new visits to the group-buying site webpage.

We identified a difficulty in the analysis of the «Goal Completion» KPI in what concerns its dynamics and the correlation to Facebook indexes. The explanation is the fact that the intention to buy cannot

be directly related to the source of the access to the group-buying site. It indicates that purchases are influenced by other factors related to the market and specifications of each product or service offered, especially in a group-buying website with no defined portfolio, but a great variety of products/services with huge sponsorship rotation, i.e., the offer depends on the supplier negotiation. When considering data and the analysis, it is possible to conclude that, in addition to becoming efficient platforms for the relations between consumers and users, social networks, e.g. Facebook, can be used as a source of reaching potential consumers for online shops, which can be improved when the compromise of their visitors is overcome and when acted according to the pre-defined goals.

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