SEO vs PPC: A Model To Determine The Most Effective Digital Marketing Budget Division

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Abstract

Many search engine marketing campaigns channel most of the budget towards pay-per-click (PPC) schemes, with a small fraction going towards search engine optimisation (SEO). This research aimed at finding the best way to allocate a marketing budget across these two platforms. Firstly, a comparison was made between high-ranking websites to see how PPC and SEO respectively have been applied. It was found that an investment in SEO was seldom made. Secondly, the cross-over point between expenditure on the two systems was determined in a case study. It was determined that the website traffic crossed over after around three months, and the expenditure after six months. From this point onwards SEO became more cost-effective. Finally, the cost per acquisition (CPA) was determined for both PPC and SEO. Results show that the CPA for SEO was significantly lower than for PPC, in all the test cases investigated. In conclusion, a dual approach is proposed. A model was designed, which could be applied to design a cost-effective search engine marketing strategy. When applying this strategy correctly, expenditure will be reduced and yield increased.

Keywords: *search engine; ppc; seo; digital marketing*

1. Introduction

The Internet started making an impact on the business world during the mid-ninety nineties, and has since grown dramatically in the number of users. During 2005 there were around one billion users, growing to about 3.5 billion in 2016. Africa alone saw a growth rate of about 2 500% in 2011 [24]. User access to product information, services, their pricing and other essential information has become a lot easier [30]. Most modern search engines (including Google, Bing and Yahoo!) display two types of results: paid results at the top (resulting from a pay-per-click {PPC} scheme), and natural (or organic) results lower down on the screen. Each set of results is ranked according to its own algorithm – ideally a given website should rank highly in both. Doing effective search engine optimization (SEO) on a website should improve the ranking in the natural section [25], and running an effective PPC campaign should increase a website's ranking in the paid section of search engine results.

1.1 Search Engine Optimisation (SEO)

Previous research has proven that most users expect to see relevant search results on the first page rather than further down [36], and they do not like scrolling down to view results lower down. As a result, it has become imperative for e-commerce websites to rank highly for certain search queries. If this is not the

case, those websites will experience a decrease in visitor count, resulting in fewer sales and a reduction of income for e-commerce websites.

Improving the ranking of a webpage in the natural result section involves many factors playing a role – often categorized as being one of on-page or off-page SEO. On-page SEO refers to what a website owner can easily change on the webpages themselves. This includes the webpage text, meta-tags, anchor text, and a number of other factors [41]. Off-page SEO refers to elements which are outside the direct control of the website owner – mostly in-links (backlinks), which are hyperlinks pointing from other websites to the website in question [34], [36].

1.2 Pay-per-click (PPC)

Around the turn of the century it was predicted that search engines would adopt a business model of using some form of micro-payment to survive [9]. This has materialized in the form of paid advertising, where the user might see two types of results on a search engine result page (SERP), often without understanding the difference. Natural (organic) results are produced by the search engine, based on SEO, and paid results (in a separate area) are produced as a result of a PPC scheme [10].

2. Literature Review

2.1 Introduction

The volume of information available on the Internet cannot be measured [37], although some authors did try to calculate the actual size – Ambergreen estimated in 2005 that over 1.3 billion webpages were available at the time [1]. It was impossible (during the early years of the Internet) to simply find relevant information, since no complete index was available. Search engines improved this situation, assuming that the search engine knows about the existence of the website a user might be interested in finding [40]. As long ago as 2001 researchers estimated that about 80% of Internet users make use of search engines to find relevant information [33].

2.2 The Internet and Business

There is no doubt that the Internet has transformed business – this was already noted around two decades ago [11]. Singh claimed that, while it took telephone technology 35 years to attain a 25% market share, the Internet managed that in only seven years [32]. However, it cannot be assumed that all business websites are automatically well-designed according to industry best-practice rules [35]. Previous research has proven that this is not always the case, given one specific industry [4].

Apart from the obvious advantages of e-commerce versus bricks and mortar selling, the Internet makes it possible to measure just about everything clients do before, during and even after purchasing. This is something which business was not familiar with from pre-Internet days. With a (free) measurement system like Google Analytics, it has become possible to record and interpret every move the Internet user

makes. The chain of events leading up to an actual online sale can now be dissected in an attempt to increase the rate at which users convert from casual browsers to paying customers [7], [8].

The exponential growth in mobile users has also changed the way business operates. The number of devices connected to the Internet has bypassed 12 billion in 2013, and payments made using a mobile phone approached the $1 trillion mark at the same time [2]. It is no secret that any online business has to ensure a strong presence in search engine indices to ensure exposure to potential clients.

2.3 Search Engines and SEO

One the one hand, search engines provide users with a free method of finding relevant information, including products and services for sale, on the Internet [37]. On the other, due to inherent human laziness and low-quality search query generation, a webpage which does not rank well (high up) on a SERP, will simply not draw many clicks [36]. It has been proven that a user who is familiar with the content of a given webpage can easily construct an effective search query, resulting in listing this webpage high up in the search results. However, asking another person to repeat the process, without being aware of the website content, often results in search failure [16].

The website owner (especially for e-commerce websites) must ensure that proper search engine marketing (SEM) is done, to improve the chances for the business website to rank highly in both PPC and natural results [6]. There are basically two methods to do SEM: use SEO and/or PPC. SEO involves the application of a large number of interrelated best practice guidelines to make the website more "crawler-friendly" [20]. Once the search engine crawler visits this website, it should be able to extract more meaning out of the content, causing it to rank better for relevant queries [21], [39].

SEO is an ongoing process, with the highest expenditure at the start, tapering off to an almost negligible figure over time [19]. Some of the elements involved in SEO are relatively simple and non-technical (including writing good content, setting up meta-tags, Alt text and anchor text), while others could become quite time-consuming and technical (link-building, download speed, and others).

2.4 PPC

PPC advertising is commonly used to draw paying clients to e-commerce websites [22]. It is generally accepted that PPC and SEO can be used together, as part of an overall marketing strategy [5].

The functioning of a typical PPC system is auction-based – participants bid on one or more keywords and/or key-phrases [27], [29]. The more popular a keyword, the higher one will have to bid to ensure that the PPC ad shows on user screens [38]. As an example, Google claimed a revenue of $8.44 billion in only the fourth quarter of 2010, of which 97% was contributed by their PPC system [38].

Previous research has however proven that users seem to trust organic results more than paid results. Figures of around 50% to 60% preference for organic results have been noted [28], [14]. However, the top

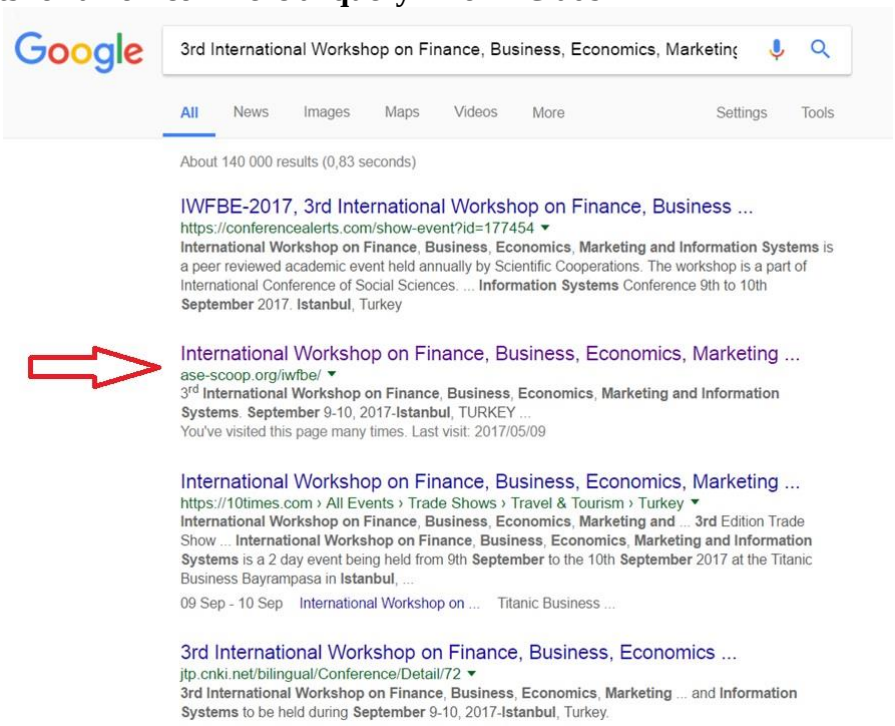
paid results are displayed above the top organic results, theoretically drawing user clicks away from organic to PPC results.

Initially only the bid price determined the ranking of PPC advertisements, but that raised some ethical issues. Currently, the ranking is a result of the product of the bid price and the QS (quality score) – a new measure introduced by Google to weed out websites trying to draw clients in an unethical way [26].

Whether SEO or PPC (or both) are used, the fact remains that drawing users to a website is the top priority. Once they have arrived, the next step is to convert them from a casual browser to a paying client. This conversion process involves other factors outside the scope of this paper, including the usability of the website, and other factors prescribed by viewing historical user behavior data through an analytics system.

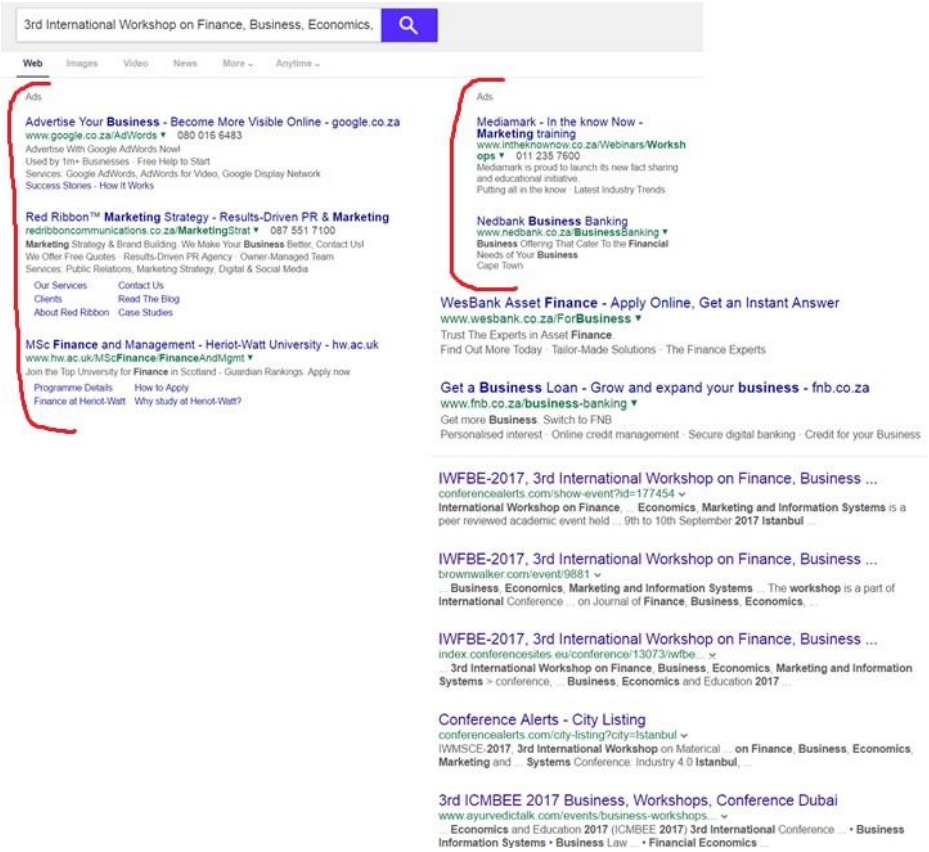
Some simple searching experiments prove how these two types of digital marketing are often used. When using a search query that does not have a strong commercial undertone, like: "3rd International Workshop on Finance, Business, Economics, Marketing and Information Systems Istanbul 2017" (without the quotes), a number of organic results, but no or irrelevant advertisements show up – see Figures 1 and 2.

Figure 1 Google results for a non-commercial query – no PPC ads



Source: www.google.com

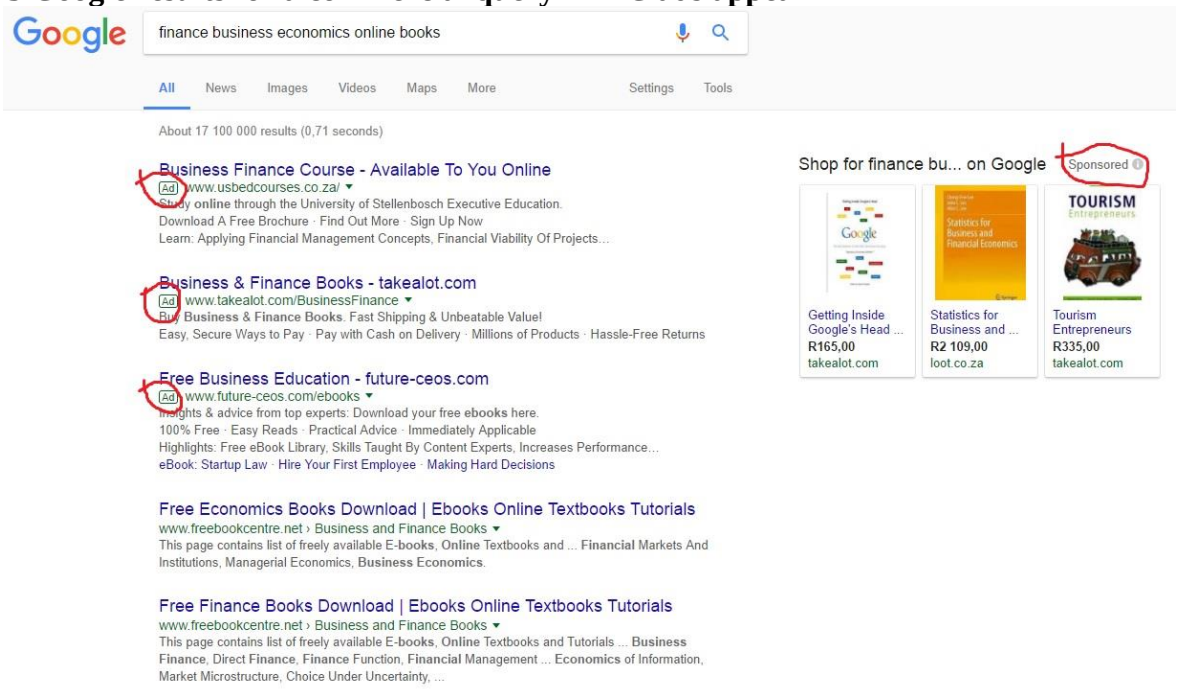
Figure 2 Yahoo! results for a non-commercial query – only irrelevant PPC ads



Source: www.yahoo.com

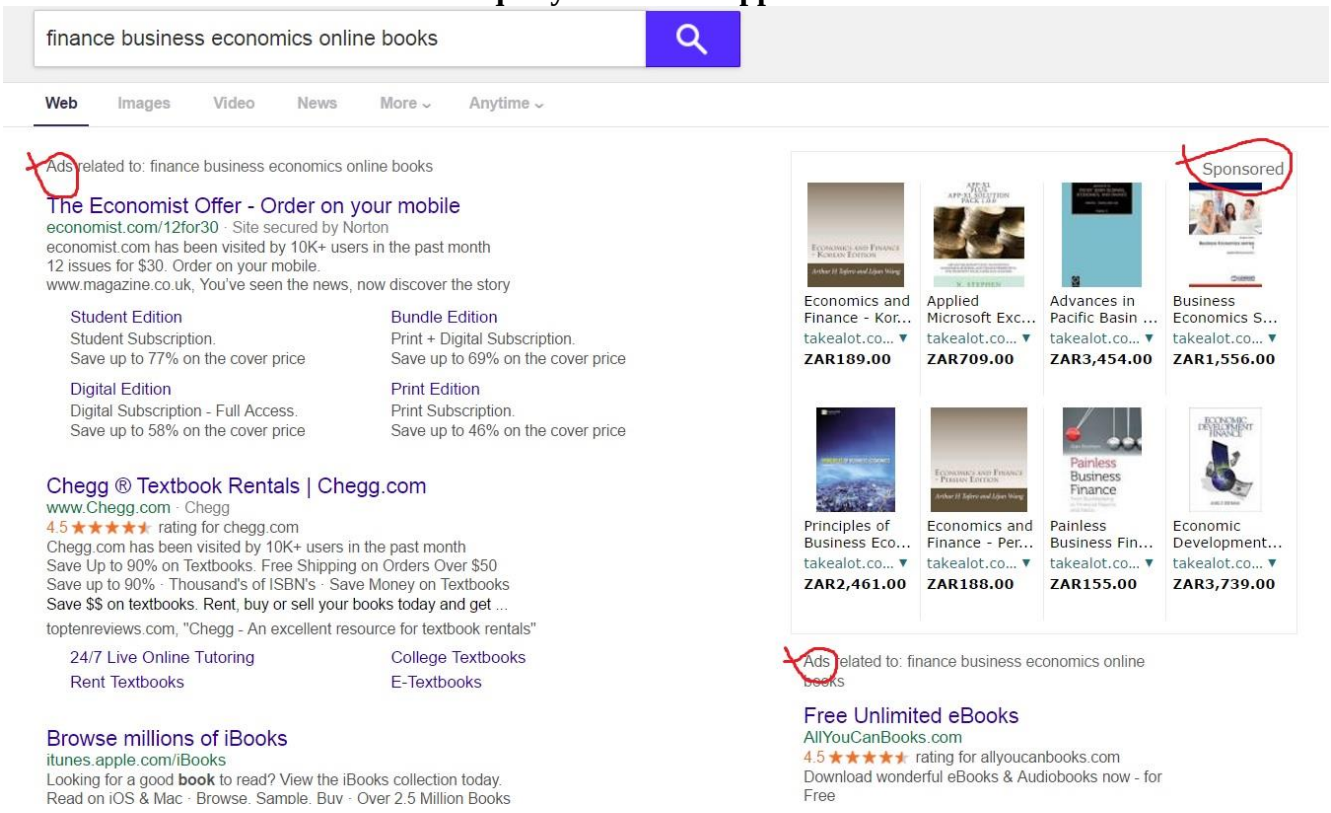
However, when a similar query is used, after "adjusting" it to include a commercial undertone (in this case: "finance business economics online books" (without the quotes)), PPC ads start appearing on top of the organic results – see Figures 3 and 4.

Figure 3 Google results for a commercial query – PPC ads appear



Source: www.google.com

Figure 4. Yahoo! results for a commercial query – PPC ads appear



Source: www.yahoo.com

3. Research Problem

It has been established many times that an online presence, especially for an e-commerce concern, is not negotiable [15]. More than a decade ago the estimated spending on online transactions globally was already noted as being $102 million [3]. Search engines drive a large amount of traffic to websites – mostly through either SEO, PPC or both. Most business websites should strive towards ranking highly in either natural, or paid, but preferably in both types of listings [15].

Other authors have claimed that spending on these two digital marketing platforms can be split as being 82% on PPC, 12% on SEO and 4% on other platforms (Sen, 2005). However, it is generally accepted that spending SEO decreases after an initial peak, while PPC spending continues as long as the campaign remains active [17]. This points to a contradiction, which is one of the motivations behind this research.

There appears to be contradicting results from previous research, whether natural or paid results are more popular in terms of clicks harvested. A claim has been made that 60 – 68% of users prefer clicking on organic results, while only 14 – 40% prefer PPC results [12]. This trend seems to be confirmed by other authors [28]. However, the same author claims that if one of the two marketing platforms is ignored, potential clients will be lost.

Hence the research problem can be stated as that website traffic maximization (and therefore the return on investment {ROI}) is at risk without clear guidance as to the budget split between SEO and PPC marketing.

4. Research Methodology

This research project was done in three phases, involving three separate empirical experiments.

4.1 Phase 1 – SEO & PPC simultaneously

Firstly, an experiment was done on websites which did invest in PPC, to determine if they also invested in SEO. One of Google's directories was used to identify 13 common item categories, like: Computers, Family & Community, Finance, Food, Gifts & Occasions, Real Estate, etc. Many experimental searches were then done for each category, using first a fat head search phrase – a short, wider and less focused search query. Another search query was also constructed for each category – this time a long tail query, which is longer, more focussed and specific. On each SERP, the first 10 PPC results were recorded. Further multiple searches were then done to determine if these same websites did appear in the first 100 organic results, using the same fat head search queries.

To ensure result accuracy, a cross-check was done. The PPC results generated by each fat head query were checked to see if they had organic results for the long tail queries. This was then repeated with the PPC results generated by the long tail search queries, and all results were recorded [19].

4.2 Phase 2 – PPC only then SEO only

Secondly, another experiment was done in a case study on one e-commerce website, using first only PPC, then switching over to only SEO, with the purpose of determining which one produced more website traffic, sales and ROI in the long run. The company involved was a small local manufacturer. Digital analytics were used to gather data on user behaviour, and website traffic and financial expenditure were recorded. The website owners invested in PPC only for 1 year (at ZAR3 000 per month), without spending anything on SEO. They then terminated the PPC campaign, with the expenditure also ceasing at that point. A once-off expense of ZAR19 000 was then made on a SEO campaign. Various basic on-page SEO elements on the website were identified and improved. These include: header tags, image filenames, meta-data, Alt tags, and textual descriptions.

After these improvements, traffic figures and expenses were still monitored and recorded for a period, before drawing conclusions [18].

4.3 Phase 3 – PPC versus SEO – lowest cost per acquisition (CPA)?

Thirdly, a final comparative experiment was done on three different e-commerce websites, in an attempt to determine how the CPA compares between SEO and PPC. The three websites were from different industries, and in all cases both SEO and PPC were used to market. Digital analytics and other methods were again used to gather data, and the websites were monitored for 90 days. Website 1 is in the bedding and linen industry in South Africa, No 2 is a toy retailer in the UK, and No 3 is in the roadside assistance industry in South Africa. In the case of No 3, one specific goal conversion was used instead of traditional sales, being new membership sign-ups.

All three were using Google Adwords as a PPC platform, and these figures were recorded for the expenses. The following are some of the types of data recorded for all three websites, for both SEO and PPC:

- number of clicks harvested
- number of user sessions
- e-commerce conversion rate (for No 3: goal conversion rate)
- number of transactions

Finally, the CPA was calculated [17].

5. Results and Interpretation

5.1 Phase 1 – SEO & PPC simultaneously

The 26 search queries (13 categories x 2 types of queries x 10 results per page = 260 websites) generated a large volume of results, summarized in Table 1. Those websites without showing any results for SEO were marked N/A. The top half of the table lists those websites which did produce results for fat head keywords. The bottom half shows those websites with PPC results for long tail search queries.

Table 1. Fat head and long tail results

	SEO results			
		Fat Head PPC	Fat Head	Long Tail
1	www.Oracle.com/SiebelCRM	3	44	19
2	www.SAP.com/CRM	10	43	6
3	www.bidorbuy.co.za//babyroomfurniture	3	N/A	8
4	www.carinsurance.co.za/quotes	6	80	8
5	www.insurancejunction.co.za	7	N/A	21
6	www.johannesburg.gumtree.co.za	1	N/A	13
7	www.privateproperty.co.za/rentals	2	N/A	1
8	www.arkinflatables.com	1	98	N/A
9	www.seaeagle.com	2	3	N/A
		Long Tail PPC	Fat Head	Long Tail
1	www.oracle.com/siebelCRM	3	44	19
2	www.sap.com/crm	7	43	6
3	www.bidorbuy.co.za	1	N/A	8
4	www.firstforwomen.co.za	1	N/A	1
5	www.carinsurance.co.za/quotes	3	N/A	8
6	www.insurancehound.co.za	4	80	47
7	www.insurancejunction.co.za	6	N/A	21
8	www.floorsdirect.co.za/gauteng	1	87	1
9	www.privateproperty.co.za/johannesburg	2	N/A	1
10	www.propertygenie.co.za	5	N/A	76
11	www.gumtree.co.za	6	N/A	16
12	www.arkinflatables.com	5	98	N/A
13	www.seaeagle.com	6	3	N/A
14	www.nauticexpo.com	9	N/A	65

Source: [19]

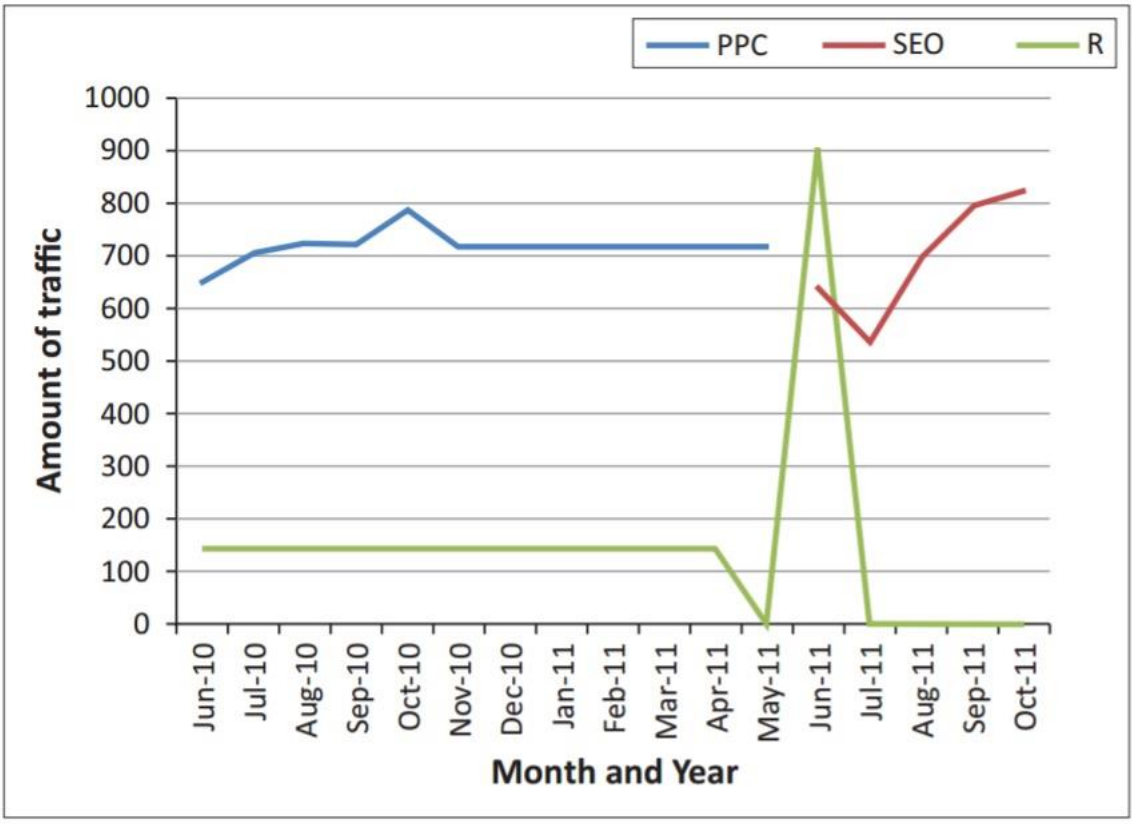
The results proved that few of the websites which invested in PPC also produced highly ranked organic listings in the top 100 results for either of the two types of search queries used. This suggests that digital marketers seldom include SEO as part of their SEM campaign. When assuming that both would cost the same over a selected period of time, SEO would still require a lower investment in the long run, confirming the contradiction noted elsewhere.

Further research would be required to determine the reason behind this phenomenon, but at this stage it has to be assumed that marketers choose PPC since it requires no understanding of website structure or design, and expenses can be tightly controlled. A typical small to medium-sized PPC campaign can also be run in-house, retaining control inside the company.

5.2 Phase 2 – PPC only then SEO only

As could be expected, this experiment proved that the implementation of a PPC system can produce favourable results, if it is acceptable that there will be a fixed monthly expense. Once the campaign was terminated, website traffic dropped to virtually zero. On the other hand, the implementation of an SEO campaign requires a relatively large investment at the start, but very little after that. After the initial dramatic drop in traffic, SEO started producing a gradual increase in traffic, bypassing the figures produced by PPC only after about three months. The expenses for the two systems crossed over after about six months, with the monthly expense of SEO decreasing consistently into the future (see Figure 5). As expected, the PPC traffic was fairly stable while the campaign was running (blue line), then dropped to zero when it was terminated. Shortly after that, SEO traffic started picking up (red line), eventually bypassing the average PPC level. Expenditure wise, there was a consistent cost per month during the PPC period (green line), which dropped to zero after termination of the campaign, then peaked sharply as the invoice for the SEO was paid. However, after the peak, it dropped to zero. This high initial cost was then spread over the remaining months in all calculations.

Figure 5. Cross-over points for traffic and expenses



Source: [18]

5.3 Phase 3 – PPC versus SEO – lowest CPA?

After recording and combing all the results, each website's data was summarized. See Table 2 for an example of website No 2's data.

Table 2. Calculation of CPA for website No 2

Website 2	PPC	SEO	Ratio-PPC:SEO
Clicks	322483	3871508	12
Cost	£85 594,69	£3 372,13	25,4
CPC	**£0,27**	**£0,00087**	**310,3**
Sessions	442399	4872537	11
Bounce Rate	59,55%	26%	2,3
Pages/Sessions	3,19	6,08	1.9
Ecommerce Conversion Rate	**1,78%**	**0,85%**	**0.5**
Transactions	7869	41186	5.2
Revenue	£354 876,22	£2 163 584,37	6.1
CPA	**£14,92**	**£0,10**	**149.2**

Source: [17]

From website No 2's data it can be seen that PPC contributed 96% and SEO only 4% of the total marketing expenditure. The CPA was calculated as a ratio, where a value of 1 would indicate the same CPA for both methods. Any value higher than 1 indicates a proportionally better CPA for SEO.

In contrast, SEO produced 92% of all the clicks on the website. This seems to indicate a reversed situation: the platform absorbing the most money produces by far the least income.

After combining the data of all three websites, and summarizing it, Table 3 shows the overall results. A higher value for cost-per-click (CPC) and CPA is worse, where a higher value for Conversion Rate is better [13].

Table 3. Calculation of averages for CPC, Conversion Rate and CPA

Measure	Website 1	Website 2	Website 3
CPC	4.1	310.3	36.0
Conversion Rate	0.6	0.5	0.1
CPA	2.6	149.2	4.4

Source: [17]

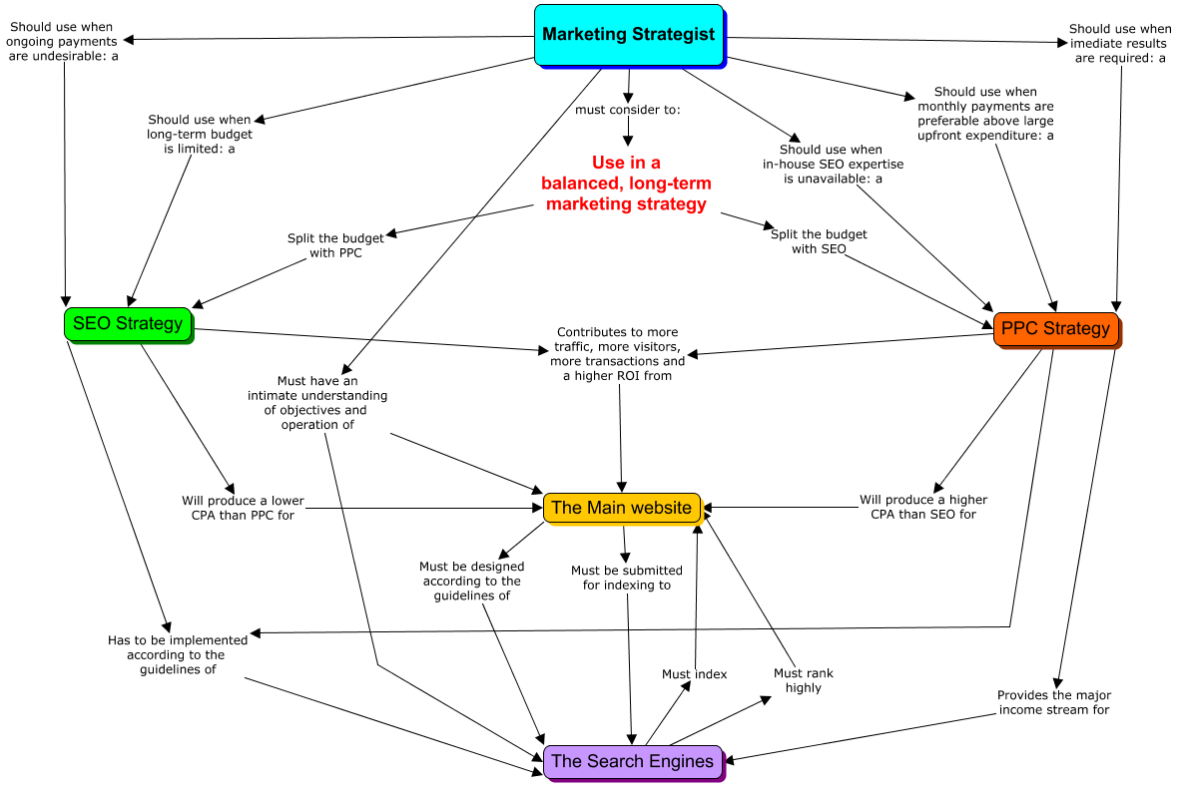
The CPA for SEO is, on the average (and in each individual case), lower than that of the PPC campaigns. When averaging the averages, the CPA is about 52 times higher for PPC than for SEO. This implies that an expense of ZAR100 on SEO would require ZAR52 000 on PPC for the same results.

6. Marketing Model

The author would like to present a model, combining the results of the three experiments, as a proposed strategy for splitting a marketing budget across both SEM channels. This model allows for freedom of choice, where some industries might have different expectations than others from their marketing efforts, and certainly differing budgets which must be stretched to cover as much as possible.

Each block in the model (see Figure 6) involves decisions to be taken, based on the company's requirements and unique situation.

Figure 6. Model to determine budget split across SEO and PPC



Source: [17]

Correct application of this module should produce the maximum financial returns for an appropriate marketing expenditure.

7. Conclusions, Significance and Recommendations

It can safely be assumed that marketing budgets in most companies are under constant pressure to be utilized to its maximum, giving the highest returns for the lowest inputs. The results of this study indicate that tilting a budget in favour of SEO as opposed to PPC has many advantages. However, using the proposed model (see Figure 9), companies can use PPC when their needs prescribe, for example, immediate traffic to a website, or a monthly payment rather than a large up-front expense.

However, this research has proven that running a PPC campaign only could be unwise spending of precious marketing dollars. A sizeable part of market share can be lost this way. This finding can be especially significant when the power of scale is applicable. Large corporations with high monthly marketing expenses, for example, could make relatively small adjustments in the way they spend money on SEM, which can be amplified to result in large amounts of savings. This research contributes to the body of SEM knowledge by proving that inconsiderate spending of money on digital marketing could miss the target, and lead to great losses.

The author recommends that all business adopt this model, or a variation of it, in their marketing departments.

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