

# Keyword and Backlink Utilization in Search Engine Optimization of Pilot Training Centers in Vietnam

Phan Thi Nhu Quynh<sup>1,\*</sup>

<sup>1</sup>Vietnam Aviation Academy, Vietnam

\*Corresponding Author/Email: quynhptn@vaa.edu.vn

Manuscript received: October 17, 2023 / Revised: November 15, 2023 / Accepted: November 20, 2023

## ABSTRACT

Linguistic disparities pose challenges to researching keywords and backlinks in website SEO campaigns across a vast global scope. Website administrators must align with the language and popularity of reference websites in constructing SEO strategies tailored to each language profile. This article dissects the employment patterns of backlinks and keywords on websites of pilot training centers in Vietnam. Drawing upon Keyword Effectiveness Index (KEI) results and statistical analysis of keyword frequencies, ratios, source attributes, and backlink quality, it appears that local businesses may outperform globally-oriented service providers in website SEO campaigns. Moreover, the study provides a compilation of recommended keywords and backlinks that may potentially contribute to the augmentation of website Search Engine Optimization (SEO) for pilot training institutions in Vietnam. This is particularly unique in Vietnam as the search behavior of Vietnamese individuals typically employs the Vietnamese language for keyword searches, and all efforts to utilize the widely spoken English language do not yield the desired outcomes.

**KEYWORDS:** Keyword, Backlink, Search engine optimization, Pilot training

## 1 Introduction

The severe shortage of pilots for recovering the commercial aviation era after the Covid-19 pandemic (IATA, 2021) is a vast opportunity that pilot training centers should take into account. In order to attract more trainees, pilot training centers have to conduct various techniques to promote their good training services. In addition, the presence of the covid-19 pandemic drastically changes how people interact with the rest of the world. Online information search activities, which used to be advantageous, are now more dominant and show superiority. Since then, communication and marketing activities of pilot training centers are now the spearhead in the package of strategies to reach out to potential groups who want to acquire training services.

Understanding the formula to reach these target audiences is essential for pilot training centers to establish closer relationships with potential students. Achieving visibility in front of customers in cyberspace relies heavily on how the organization understands how the search engine works. By satisfying Search engine (SE) algorithms, an institution can get a high position in the Search Engine Result Pages (SERP), attract more organic traffic, and increase its chances of reaching potential customers (Baldauf, 2021).

Search engine optimization (SEO) encompasses numerous factors, with keyword and backlink elements being of primary importance. Search Engine Optimization contains many techniques divided into On-Page and Off-Page. On-Page focuses on optimal on-site, Off-page priority on the outside (Rehman, 2013). It will not be rational to allocate resources for all the techniques because it is costly and inefficient. Instead of distributing resources for all strategies on-page and off-page,

web owners should concentrate on limited technical areas. Among them, keywords and backlinks are the most prominent (Ziakis, 2019).

Keywords represent the relationship between what a user searches for and what the site has (Ziakis, 2019). Backlinks represent the site's credibility and reputation (Serrano-Cinca, 2019). Two of these factors are cornerstones for the other factors of SEO. Some of the previous authors researched SEO activities. They went from the values and benefits of SEO to emphasize the role of keyword and backlink elements or suggest the framework, the rule to improve the effectiveness (Özkan, 2020). Few of them applied their results in real-life situation (Khan, 2018). Văn Sơn (2018) suggested a list of potential keywords for a tourism website in Vietnam. However, there exists a gap in research concerning pilot training websites, despite their unified objective of utilizing websites as a means to disseminate information and captivate online users. We propose a comprehensive keyword research and backlink generation process to address these flaws in this study. This study aimed to identify, evaluate and compare methods of using backlinks and keywords in search engine optimization activities of target websites. Then, propose to pilot training centers a set of keywords and a list of potential backlink locations for future SEO activities. The outcome of this study may help these websites improve their SEO strategies.

The following section will raise some related works to illustrate research gaps. Subsequently, this investigation will present an extensive literature review encompassing keywords and backlinks, followed by an exposition of the methodology employed to implement the proposed procedure on targeted websites, along with an analysis of the outcomes derived from this research endeavor.

## 2 Previous work

### 2.1 Keyword research

Lutze (2009) propose a keyword research process that involves or incorporates four steps (1) creating a position statement, (2) performing a keyword branding section, (3) using a keyword discovery tool, and (4) recognizing your negative keywords. Lutze emphasized the importance of company statements in identifying keywords that accurately represent products and services and align with the target audience's search queries. Yalçın (2010) suggested preparing a list of potential keywords found via keyword analysis in the top 5 search results or popular links.

A keyword research method was explained similarly by O'Neill (2011) and Zhou (2012) where the selection of keywords should best define the content of websites. It means that the keywords should be relevant to the content on websites. Furthermore, they highlighted the need to consider the effects of high-traffic keywords, as some search phrases may not contribute to good SEO performance despite generating many search hits. It will be more competitive if keywords generate outstanding traffic. Zhou (2012) also added that keywords should not be too all-encompassing as this might promote competition, nor should they be too narrow as people rarely avail them for search.

Khan (2018) expanded on keyword research by discussing keyword discovery via the suggestions gathered from the client. This system gave keyword selection a more multidimensional perspective. Understanding target customers and taking care of their feedback is one of the most effective ways to approach them and increase the quality of search engine optimization. The authors also mention the usage of Keyword Effectiveness Index (KEI), which is based on the generated traffic in search engines, to measure keyword efficacy. The reality of traffic could contribute to the success of the SEO strategy. In this study, we understand KEI as "square number of monthly searches of the place-name divided by the number of results obtained when you search the place-name in a search engine" (Serrano-Cinca, 2019).

The works above left an in-depth discussion on the theoretical foundation of keyword and backlink strategies. They gave great help with guidance. However, none noted beneficial or effective suggestions or recommendations for practical usage. A complete study on keyword research by Vãn Sơn (2018) with four key steps:

1. Analyze keywords based on website content and company statements
2. Using tools, customer interviews, and competitor analysis to expand keywords
3. Using the KEI, KOI, and KFI to evaluate keywords
4. Extracting keyword

This method includes all the procedures given by the earlier authors' research processes. It also adds steps such as interviewing customers, analyzing competitors to expand keywords, and using indexes to extract the most relevant terms for websites. However, interviewing customers is costly in terms of time and data acquisition. Google search presents results based on search preferences, including the user's location, to show the most relevant content (*Google for Developers*, n.d.). Tailoring content to the user's location and geographical characteristics, such as language, is indispensable.

Unless the website must be presented in many different languages, displaying too many keywords in many different languages causes resources to be spread out and not achieve their substantial influence. Identifying the correct language that the potential audience uses in their search will reduce the effort of both sides to meet each other's objectives.

### 2.2 Backlink generation

When Google cares more about the quality of backlinks, how could web owners build a quality backlink system? Backlink is the link popularity (Serrano-Cinca, 2019). The previous studies recommended some ways to recognize quality linking sources. According to Jones (2010), a high-quality link should come from a site with relevant content or an authoritative site in their industry. Older domain names might also provide more authority. Sites using the top-level domains ".edu" and ".gov" should also be recognized. Some SEO analysis tools can help search for link sources.

Other discussions stated that backlinks should come from places having content connected to the point of receiving the link (Ziakis, 2019). Links from industry site hubs can provide much value (Wilson, 2007). Furthermore, Khan (2018) have acknowledged the importance of addressing various reputable and reliable websites. O'Neill (2011) have advocated for the integration with prominent social media platforms like Facebook and Twitter, and others to extend the connecting system and attract more visitors. Solid bonds with others can achieve the creation of high-quality links. They also indicated that the domain's age should be considered. In optimization, the older the domain, the higher the ranking points. This article will review the preceding suggestions and add a few new ones to help web admins create a comprehensive linking structure.

## 3 Literature reiview and proposed framework

### 3.1 Keyword optimization

Keywords are a group or single words used to find information in a search engine (SE) to help SE crawlers find, review or analyze web page content to show relevant web pages for keyword queries (Zhou, 2012). If the keyword is irrelevant, this might cause a negative approach (Yalçın, 2010); crawlers may not find the target page to rank or rank low on the Search Engine Results Page (SERP). Keywords are also the foundation for other factors in On-Page SEO. Keywords can be employed in URLs, title tags, meta tags, description tags, and page content, but note that keywords must be relevant to the content. This is the main activity of On-Page SEO (Khan, 2018). Choosing the right keywords could help website owners navigate the content (Vãn Sơn, 2018) and closely interact with users.

The keyword optimization process includes three main activities: (1) Keyword gathering and selection; (2) Keyword analysis; (3) and Keyword extraction.

In the initial stage of keyword research, gathering and compiling a comprehensive list of potential keywords is essential. Firstly, focusing on direct competitors with similar business goals and target clients can provide valuable insights into statistics on their keywords, aiding in the discovery of potential keywords closely related to content. Then, understanding users from their perspective is a strong foundation for keyword identification. Gathering client feedback, conducting interviews with potential clients, and

leveraging affordable methods like creating forums or utilizing social media platforms can provide valuable insights into customer needs and thought processes and facilitate filtering relevant keywords (Khan, 2018). Finally, Utilizing popular SEO analysis tools such as Moz, Ahrefs, and Semrush can be highly beneficial for discovering related keywords.

Keyword analysis is to set criteria to obtained relevant to website content. Keywords must convey most of what the company wants to convey to the customers so that consumers may find the website through search queries (Rehman, 2013). Furthermore, search engines rely on keywords to rank websites, and with proper keyword optimization, generating high traffic alone would be possible for the company as it would fail to reach the intended target audience, emphasizing the interconnectedness between keyword selection and achieving desired goals. In case the service is an online course, keywords should link to online education, distance learning, and online class and include those phrases in the contents. However, keywords must be user-friendly (Rehman, 2013). If these keywords are not on users' top of minds when they search on Google, those keywords do not play any roles. The top priority is to reach out to users, so selected phrases should be familiar to searchers. Besides, seek keywords that are relevant to target users' segmentation. Moreover, a list of prominent keywords does not mean web owners will get noteworthy results. Assessing the value of each keyword is a crucial step in the SEO process. Consider calculating the KEI and measuring the traffic generated from competitors' use of the above keywords to help extract the best-qualified keywords. Measuring the actual traffic generated by keywords on competitor websites is another helpful technique to determine keyword efficacy (Khan, 2018). This allows for estimating how much traffic this keyword will generate in the future. The higher the traffic acquired means, the more influential keyword. Therefore, careful keyword selection by combining the topics suggested and analysis, usually by SEO analytic tools, are two needed actions in keyword implementation. KEI has been recommended to use (Gaou, 2017). The list of keywords might be sorted by their popularity or search volume and competition to collect to most suitable keywords. Khan (2018) also suggested using KEI to select effective keywords with the following equation (Eq. 1).

$$\frac{\text{MonthlyLocalSearches} \times 2 \times 1000}{SERP} \quad (1)$$

However, this formula has not been used in practice to calculate KEI. Another formula has been proposed and used in practice by Son & Thai, (2018) and used in actual cases. The formula is in a particular way as in Equation 2:

$$KEI = \frac{(4-R)}{3} * \frac{Sv^2}{Cs} \quad (2)$$

Where R denotes the keyword's relevance to the target content, with levels 1 = Related, 2 = Normal, 3 = Less Related. The average monthly search (Sv) is the average number of monthly searches for the term and its close variations. Cs is the number of websites competing on the Internet with the keyword in their website and is determined based on the total number of results returned on the Google search engine when running a search engine. Cs in the algorithm can help recognize and avoid highly competitive keywords. The value scale of KEI is from 0 to 10. The greater the keyword's KEI, the more competitive and effective it is (Jones, 2010).

Son & Thai (2018) use additional Keyword Opportunity

Index – (KOI) and Keyword Feasibility Index (KFI) to provide parameters to help determine the probability of success and existence of keywords. When proposing prospective lists of keywords, it is unnecessary to impose strict recommendations. Ultimately, individuals or organizations employing these keywords can readjust them according to their specific objectives.

Keyword extraction is the final phase. Remind that keywords should include the above elements: relevant, appropriate for business, user-friendly, and terms from the competitor's site. When analyzing keywords, the priority is sorting traffic in descending order to evaluate the actual effectiveness of each phrase. To identify the most valuable terms, prioritize keywords based on their KEI, as higher KEI values indicate greater keyword significance, enabling the creation of a list of potential keywords sorted in descending order.

### 3.2 Backlink generation

Backlink is the emphasis factor in Off-Page SEO (Khan, 2018) and is among the two most effective website rankings (Wilson, 2006). Google uses links to measure page ranking. According to Page & Brin (1998), PageRank measures links like a vote to consider the importance of each page, with more links indicating greater popularity and page quality. This is crucial as Google takes into account factors such as relevance, expertise, authority, and trustworthiness of pages to provide the most relevant search results (Google, n.d.).

Moreover, a target page can improve ranking and traffic by getting more backlinks (Khan, 2018). Especially for new or uncommon pages that want to attract crawlers because they can find, discover or update pages based on links from the pages to each other (Zhou, 2012). Nevertheless, some have used it to trick the Google ranking algorithm into achieving a high rank by spam links or paying for a link. Google discovered this soon and claimed that the sites that try to abuse Google's quality guidelines would likely be removed from their indexing system and no longer displayed on their platforms and associated partners. Thus, paying attention to building a quality backlink system is essential. The higher the quality and position of the backlink, the more appreciated the potential site (Ziakis, 2019).

## 4 Methodology

This study used the method that was used by Văn Son (2018)– analysis SEO tool to support us collect data of 5 pilot training center's websites in Vietnam market (Table 1). We tracked keywords, backlink performance of 5 websites and figure out the most used keywords, backlink sources, missed keywords of each website on 31 days from April 13th to May 13th in 2021.

We calculated the average number of keywords and conducted the same activity for backlink analysis to identify how the 5 pilot training center's websites in Vietnam were running the keyword and backlink strategies. From this step, we also stratified the keyword and backlink sources common in each website and the missed keyword, backlink sources between each other. Moreover, to determine the effectiveness of the keyword and backlink strategies of 5 pilot training center's websites, we calculated the average percentage the number found out in the previous step.



**Table 1.** List of five inspected sites

Institution	Website
Baa Training Vietnam Company Limited	baatraining.vn
Viet Flight Training Joint Stock Company	bayviet.com.vn
Aviation School Of New Zealand Company Limited	aviationschool.vn
Venture Aviation Training Corporation	ventureaviation.net
Stanford Aviation International Company Limited	stanfordaviation.com.vn

We compiled a comprehensive list of commonly used keyword and backlink sources from various websites, eliminated duplicates, and compared them against the criteria outlined in the theoretical research section to filter out unsuitable sources. Additionally, for keywords, we assessed their potential by calculating the website traffic generated and their KEI, eliminating keywords with a KEI of 0, and prioritizing keywords based on a combined consideration of traffic and KEI, with traffic index taking precedence.

## 5 Result and discussion

### 5.1 Result

We collected 69 keywords from 5 websites, and almost all fit the criteria of a quality keyword: relevance to website content, accurately describing products and services, and being friendly with online users. Among 69 keywords, only 15/69 generate the highest traffic, the lowest of these 15 keywords generates 20 traffic, and the highest is up to 150 words. Some of them are “lương phi công”, “phi công”, “học phi công”, “học phi công ở đâu”, “học làm phi công”.

The average number of keywords used per website for 31 days. Bay Viet used 758 keywords, including 127 keywords that bring in traffic and 79 keywords that bring both traffic and relevant to pilot training content. BAA Training Vietnam had the lowest average number of keywords used but the percentage of keywords that brought in traffic similar to the website uses the most keywords - Bay Việt, while Venture despite being in second place in terms of keywords used, the keyword that brings the lowest percentage of traffic.

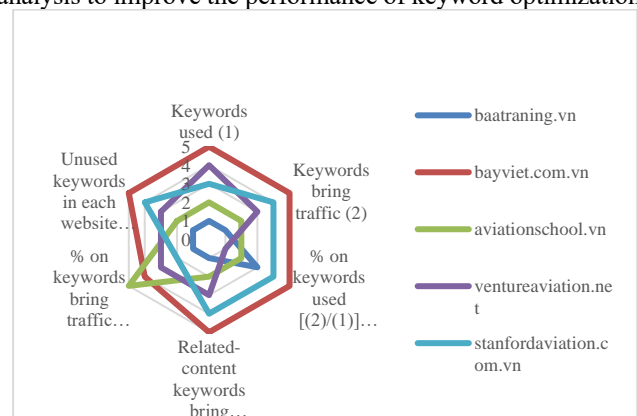
Table 2 showed the average number of unused keywords comparing to others, we saw BAA Training Vietnam has 37 most unused words out of 5 websites, followed by Eagle Aviation School 21 words, Venture 12 words, Stanford 10 words and Bay Việt 1 word. In the first position, Bay Viet has the best keyword optimization performance. They have been operating for the longest time in the field of pilot training, which is why they had the highest ranking. Keywords on their website focused on learning costs, career opportunities, and entry standards. Compared to the remaining four websites, the number of keywords that their website does not have is only 1, so they can be considered as a "model" in optimizing keyword operation in pilot training. After extracting the duplicates among 79 words at the last statistical step, we collected 57 keywords.

**Table 2.** Keywords

	Keywords used	Keywords bring traffic	% on keywords used	Relevant - content keywords	% on keywords bring traffic	Unused Keywords
Bay Việt	758	127	16,8%	78	61,9%	1
Venture	305	26	8,4%	12	45,8%	12
Stanford	226	36	15,9%	12	34,3%	10
Eagle Aviation School	106	10	9,1%	7	74,4%	21
BAA Training Vietnam	55	8	15,1%	1	14,8%	37

Although Stanford and Venture have a difference in ranking position, in general, these two websites have similar keyword optimization performance. They have entered the Vietnamese market recently, but the keywords used to focus on such content as learning costs, entry standards, and salaries of this profession, likely Bay Việt. The number of keyword statistics of Stanford and Venture is equal to 13 keywords. The number of keyword statistics is relatively small. However, it still shows that these two websites have made a significant effort in keyword research when the number of unused related keywords of Stanford and Venture compared to other websites is 10 and 12 words.

The fourth is Eagle Aviation School. The number of statistics after 31 days is 10 words, and the average number of unused keywords on their website compared to other websites is 21 words, double Stanford and Venture. Therefore, they need to pay more attention to keyword research based on competitor analysis to improve the performance of keyword optimization.

**Figure 1.** Comparison keyword performance among institutions

Finally, BAA Training Vietnam also have entered in Viet Nam recently, but the keywords used are significantly lower than Venture, Stanford, and Eagle Aviation School. They only have 4 keywords that brought in traffic and had content related to the pilot training. The average number of unused keywords on their website is up to 37, nearly four times higher than Bay Việt and two times higher than Stanford, Venture, and Eagle Aviation School. Through this, we can see their keyword optimization performs less than the other 4 websites. The main reason might be that BAA Training Viet Nam uses English as

the primary language on the website, so the keywords used are not friendly for online users in Vietnam. If users want to switch to Vietnamese, they have to go through the redirect to the subpage, and some Vietnamese keywords were also used in the subpage but did not bring in traffic, so they were excluded from the original analysis.

We combine and arrange the keyword lists in table 2 and table 3 in the following order: first sort the keywords that bring in traffic from high to low, then sort the KEI of those keywords also from high to low and extract the 15 strongest keywords including “lương phi công”, “trường phi công bay việt”, “đào tạo phi công”, “học phi công”, “học phi công ở đâu”, học lái máy bay”, “tiêu chuẩn làm phi công”, “học làm phi công”, “làm phi công”, “làm phi công”, “học lái máy bay”, nghề phi công”, “lương phi công việt nam”, “ngành phi công”, “học phi công”.

Finally, by comparing the keyword used in each website with the 15 strongest keywords already found, we see only Bay Viet use the strongest in Table 11, while BAA Training Vietnam does not use any of them. New Zealand Flight School unused 12 keywords, Venture and Stanford still operated all the strong keywords. Therefore, these four sites can be used to refer to the potential keywords helping to improve the search engine optimization activities.

## 5.2 Backlinks

Bay Việt has 104 websites with linking pointing to their website, out of them just have 73 websites are valuable for improving search ranking and in 73 websites only 8 websites have relevant pilot- training content. The data of others is shown in the table 4. One issue stands out in this result is that the number of linking sources of Eagle Aviation School is not as high as that of Bay Việt and BAA Training Vietnam but the number of valid websites with relevant content containing backlinks out of the total number of re-linking points is the highest. It can be seen that aviationschool.com often has links from better quality websites.

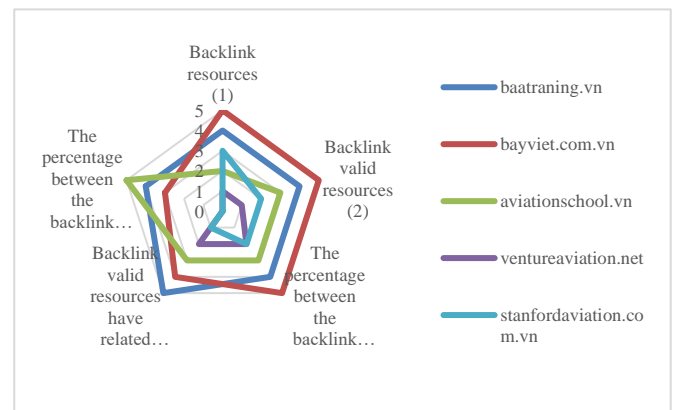
**Table 3. Backlink**

	Backlink resources	Backlink resources have the value of improving search rankings	%	Backlink resources have relevant content and value of improving	%
Bay Việt	104	73	45,75	8	4,98
Venture	9	2	23,02	0	0
Stanford	12	2	19,69	0	0
Eagle Aviation School	10	4	40	2	20
BAA Training Vietnam	45	26	56,56	6	14,29

The reason for this difference between these pilot training centers may stem from the operating environment. Bay Viet has the longest operating length in the field of pilot training, so the popularity of this center is highest, receiving more attention and trust from other websites on the Internet also higher than the other 4 websites. On the other hand, although BAA Training Vietnam has only just entered the Vietnamese market, the

number of websites with links pointing back is quite high compared to Eagle Aviation School, Venture and Stanford when the centers are also entered the Vietnamese market in recent years. In order to increase competitiveness, especially with Bay Việt, these websites need to pay attention more on link building to maximize the benefits of outbound link optimization.

Bay Viet still holds the first position in backlink optimization. The backlinks of Bay Việt mainly come from Vietnam Airlines’s website and remain from related pilot training, aviation websites such as pilotcareernews.com. In second place, BAA Training Vietnam has backlink mainly from baatraining.com, the main website of the BAA Training Center and the remaining websites have content biased in the aviation field. Similar to BAA Training Vietnam, most backlinks of Eagle Aviation School also come from the New Zealand Flight Training Center's main website, aviationschool.co.nz. The last, Venture and Stanford have no link placement value that improves search rankings or is related to pilot training, aviation or training services.



**Figure 2.** Comparison backlink performance among institutions

After the past 31 days, the total number of websites with links pointing to the websites of pilot training centers in Vietnam has both the value of improving search rankings and related content respectively as follows: Bay Việt - 8 websites, BAA Training Vietnam - 6 websites, Eagle Aviation School - 2 websites, Venture and Stanford have no websites.

We gathered 16 points to place backlinks in 5 websites. Most of these sites are foreign websites, use non-Vietnamese languages and are not popular or friendly with Vietnamese users even though these sites satisfy the desired topic criteria. We looked more on the Internet in Viet Nam to find more potential place but there are not many websites with expertise in aviation field and pilot training in particular. Not to mention the website of the pilot training centers analysis in the study, some websites with aviation expertise can be linked to vaa.edu.vn - Vietnam Aviation Academy’s website, caav.gov.vn – Civil Aviation Authority of Vietnam’s website or website of airlines in Vietnam such as vietjetair.com, pacificairlines.com, bambooairways.com, viettravelairlines.com.

Moreover, we considered some websites that may not be related to aviation or pilot training, but are popular with online users, have a high level of trust and traffic for building linking. According to Kemp's report (2021) on online activities in Vietnam, the websites with the highest search traffic through

data from search engine optimization analysis tools are summarized in the report including vnexpress.vn, 24h.com.vn, kenhl4.com.vn, dantri.com.vn, vietnamnet.vn, tuoitre.vn, baomoi.com, thanhnien.vn, soha.vn, zingnews.vn.

Combining all the websites we mentioned in the above content and websites used in 5 websites, we gather 31 websites that should link in order of priority to websites with content related to the pilot training and aviation in Vietnam followed by websites with related content but using other languages and finally websites that are popular with Vietnamese online users.

The above websites may have been used and not used in the backlink optimization of pilot training centers, some because of inappropriate usage, backlink places are not valuable for improving search rankings, thus being excluded from the analysis. With the recommended list of sites to link to, pilot training centers can review, edit links, and add links from new locations to improve backlink performance efficiency.

## 6 Conclusions and recommendations

The website will get a lot of benefit from SEO strategy if they operate this efficiently, especially backlink and keyword element on SEO which keep the main role on Off – pages and On – pages SEO. A good keyword should include the relevance to website content, consistent with company strategy, description of products or services; friendly with users. A quality backlink placement should include the relevance to website content, popularity, trustworthiness and attracting high traffic.

Through the process of monitoring and analyzing 5 websites of the pilot training center in Vietnam, in terms of keyword performance, Bay Viet used most of the relevant keywords with 57 words and all met the good keywords requirements. Other centers are ranked in descending order as follows: Venture Aviation and Stanford Aviation with 13 keywords, New Zealand Aviation School with 10 keywords and BAA Training Vietnam with 4 keywords. In terms of backlink performance, Bay Viet still holds the first place with 8 linking websites and ensures the backlink placement quality. Next is BAA Training Vietnam with 6 websites, New Zealand with 2, Stanford and Venture have no website. In fact, Bay Viet always ranks on the first page of search engine results and even in the top organic results. Finally, the subject built a keyword list with 65 words and 31 potential websites, bringing value to search engine optimization activities. Pilot training center's websites in Vietnam can use the list of recommended link places and keywords from the results of the study and select the most suitable websites to improve operational.

Due to time and financial limitations, the study only used the tool to analyze the performance of 5 target websites for 1 month, so the data collected was mainly from Ahrefs database and display their activity at the time. In follow-up research, new studies can expand the scope of research or in-depth analysis on keyword, backlink optimization, or redeploy the topic from the perspective of online users and with new research subjects to explore more aspects of search engine optimization.

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