



Promotion of mHealth Applications in Search Engines - A Study of Australia and Slovakia

Andrej Miklosik, Maria Hasprova and Stefan Zak

Department of Marketing, Faculty of Commerce, University of Economics, Bratislava, Petržalka, Slovakia

Abstract

Search engines represent an essential channel for promoting mHealth applications. Links to a website, application store, or other resources appearing on the first search engine results page generate traffic and increase the number of application downloads. The aim of this paper is to identify the state of promotion of mHealth applications from the Health and Fitness category in search engines. The authors analyzed 880 search results and determined the frequency of occurrences of various types of links directly related to mHealth applications. The findings indicate that the level of promotion varies significantly across the keyword category, platform, location, and mHealth application. The competition in search results for keywords related to two categories of mHealth applications - exercise and training and mental health - is more intense than in two other areas of healthy living - general and healthy eating/diet. There are significant differences between search visibility in search engine results pages in Australia and Slovakia.

Keywords: mHealth; Mobile Health; Promotion; Search Engine Marketing

1. Introduction

Users looking for information about products, including mobile applications, use search engines to gather relevant information before deciding to download and/or purchase the product. For companies developing mHealth applications, it is vital to secure the visibility of their products in search results. Paid advertising in the form of pay per click (referred to as “PPC”) enables the link to the website to appear instantly on the search results page (referred to as “SERP”). Investing in search engine optimization (referred to as “SEO”) enables the mHealth app to rank within organic search results.

In this article, the authors examine the methods and intensity of the promotion of selected mHealth applications in search engines. The primary objective of the research is to identify the state of promotion of mHealth applications from the health and fitness category in search engines. The secondary aims of the study are as follows:

- To define the methodology for assessing the intensity of promotion by taking the visibility within different types of search results into account.
- To determine the situation on two platforms - when searching from desktop and mobile devices.
- To compare the search visibility of mHealth applications in Australia and Slovakia.

2. Literature Review

2.1. Search engines represent an essential channel for product promotion

Many authors (Chotikitpat et al., 2015; Key, 2017; Li et al., 2014) refer to an optimal combination of SEO and PPC as search engine marketing (referred to as “SEM”). Others (Basal, 2017; Vattikonda et al.,

2015; Ye et al., 2016) suggest that SEM stands for paid advertising, and thus, SEM and PPC are equal expressions. In this paper, the authors adopt the first view, where SEM represents an umbrella term for SEO and PPC, and aim to increase the search visibility by implementing both these tools.

Ensuring that a product is visible in search results is crucial not only for SEM but also the efficiency of all digital marketing and traditional marketing tools and channels. Users use search when consuming other media (parallel use of media) and when switching from one device to another (sequential use). Thus, the visibility in search enables the user to research more information about a product he has just seen in a TV advertisement or on a billboard. The positive relationship between TV advertising and online search has already been demonstrated (Joo et al., 2016). Securing top positions in search reduces the boundaries between brick-and-mortar and online shopping (Kates and Greenberg, 2013), increases the efficiency of marketing campaigns containing above-the-line media (Joo et al., 2014; Miklosik, 2014), and fosters sustainability of marketing strategies (Miklosik, 2016).

There are various definitions of search visibility. One of the most common approaches is to use a formula that reflects the position in SERP for all the keywords assessed, taking their monthly search volume into account (SE Ranking, 2017). Moz applied a similar approach and defines search visibility as the percentage of clicks, it is estimated to receive based on organic ranking positions across all the keywords in the company's campaign (Moz, 2017). Both approaches take the SERP ranking for individual keywords into account and evaluate the SERP positions of the company's website. The higher the SERP ranking, the higher the chance of a user clicking on the link and going to the target page. There is agreement among SEO practitioners that the first 10 results on the SERP get almost all the traffic, with the first three results receiving more than half of it.

2.2. Types of mHealth applications

Various sources and authors offer their view on the categorization of mHealth apps. Chouffani (2011) uses the taxonomy consisting of six main groups of applications for:

1. Clinical assistance or assistance in diagnosis.
2. Remote monitoring.
3. Reminders and alters.
4. References.
5. Healthy living.
6. Productivity.

No official list of the best mHealth applications exists despite the various initiatives to compile TOP smartphone or mHealth app lists. They differ in the methodology for evaluating the apps (best user experience, best functions, most downloads, and top rated), the entity rating the applications (users and doctors), the segment of the applications (health and fitness and medical apps), and the targeted user (consumer and doctor).

Examples include:

- Top 50 smartphone health apps (Stringfellow, 2017).
- 15 best medical apps (Schiola, 2016).
- Best healthy living apps according to VicHealth (VicHealth, 2016).
- Top mHealth apps as rated by doctors (Wicklund, 2015).
- Top 7 medical apps for doctors (Medved, 2017).

There are more than 200 applications in the Health and Fitness segment, both in iTunes and Google Android. On iTunes, it is possible to sort apps by popularity (number of downloads). The 10 most popular applications in the Health and Fitness category as per 4 October 2017 were MyFitnessPal, Fitbit, Lose It! - Calorie Counter, Map My Run by Under Armour, Nike+ Run Club, Weight Watchers, Period Tracker Lite, WebMD, Runkeeper - GPS running tracker, and headspace: Guided meditation. On the Android platform, one application from the health and fitness category had more than one million downloads - Runtastic running PRO. The majority of these most popular apps is dedicated to monitoring physical activity, energy income and output, and weight; however, a few have a different use. Period tracker Lite is aimed at women and enables them to track their health using symptoms,

icons, and notes. WebMD offers healthy living information reviewed by a physician and interactive tools. Headspace is a digital coach of mindfulness using daily medications, exercises, and various sessions.

2.3. Promotion of mHealth applications

The most popular applications available for widespread use are the healthy living applications and the applications enabling monitoring and creating a track record or journal documenting symptoms between doctor visits.

The healthy living category features these types of mobile applications (Chouffani, 2011):

- Pregnancy and baby development.
- Diet assistance.
- Exercise and fitness.
- Healthy eating.

A wide range of consumers who want to use the mobile technology to improve their fitness levels and lifestyle are the target group of mHealth applications from this group. Therefore, it can be expected that companies creating these solutions will be targeting the consumers using promotional tools that are feasible for the B2C segment.

From the digital marketing tools portfolio, companies can use these tools (among others):

- Search engine marketing - increasing the visibility of their website(s), social media profiles, and other pages in Google and other relevant search engines.
- Visibility in mobile application stores (“referred to as App stores”) - paid promotion to secure inclusion in featured applications in iTunes, Google Play, or other platforms
- Social media marketing - communicating with the target audience through Facebook, Twitter, Instagram, SnapChat, and other social networks
- Content Marketing - fostering publicity by being included in blog posts of influencers, “top apps” lists, and reviews of applications.
- Videos - creating a YouTube channel enables companies to increase the visibility in YouTube and is an excellent add-on for search engine visibility.
- Email marketing - newsletters to own subscribers and inclusion in third-party newsletters.

3. Methodology

In the research, the authors focused on examining and analyzing the methods and level of promotion of mHealth applications from the healthy living category in search engines. Relevant SERPs were analyzed to detect the use of SEM tools. This process was followed to generate a complete list of all SERPs and analyze the results:

1. Keywords selection.
2. Location/language selection.
3. Search engine selection.
4. Platforms selection.
5. Examining the SERP for each keyword/location/platform combination.

The authors focused on three of the four subcategories of the healthy living category of mHealth apps (Chouffani, 2011): Diet assistance, exercise and fitness, and healthy eating. Taking these three categories and adding the subject of mental health, these three major areas of healthy living were covered:

- Exercise and training (referred to as “E”).
- Mental health (referred to as “M”).
- Healthy eating/diet (referred to as “D”).

When creating the keyword list, keywords from each of these three categories were selected, with three keywords representing the main category of healthy living in general (referred to as “G”). Using keywords, designating the type of result expected, the authors added the words “tracker” and “app”

to the basic combinations to create a complete list of keywords or search phrases organized into two keyword groups, as presented in Table 1.

Two countries were included in the research - Australia and Slovakia. The keywords prepared in English were translated into their Slovak equivalent. IP addresses from Melbourne, Australia, and Bratislava, Slovakia, were used to gather the results. Google was used as the targeted search engine because of its dominant position in both markets with search results; its market share in 2016 was 93.95% in Australia and 96.45% in Slovakia (Stat Counter, 2017a; 2017b). Search results using two platforms were analyzed - desktop (access from computers and laptops) and mobile (access from tablets and mobile phones). The combinations of search engine/location/platform will be referred to as "Google AUS desktop," "Google AUS mobile," "Google SVK desktop," and "Google SVK mobile."

As the situation in SERPs is complex, merely calculating search engine visibility as defined in the theoretical background could not be performed. One mobile application can be promoted using different types of search results linking not only to the web page of the application but also to various third-party websites enabling its download, social media, or directly to App Stores. Therefore, the visibility was assessed according to the number of appearances in SERPs for all keywords, with these four types of SERP results directly attributed to an mHealth app, and thus perceived as promotion of an app:

- Web page of the app (referred to as "W").
- Third-party website offering a direct link to download the app (referred to as "T").
- Page or multimedia file from a social media site of the app (referred to as "S").
- App store of one of the platforms - iTunes, Google Play, Microsoft Store, and BlackBerry AppWorld (referred to as "A").

A total of 880 SERP results were analyzed in detail. The number of SERP results in the top 10 for all the keyword/location/platform combinations was determined for each mHealth app, and by adding these individual values, the totals for each app category, keyword group, and type of SERP result were calculated. Websites of wearables were counted only if they contained a direct download link to their own or a third-party mobile application. Statistical methods such as mean, median, or correlation were used to analyze the results further, interpret them, and formulate conclusions.

4. Findings

Intense competition was observed when analyzing the first component of search visibility - the appearance in PPC advertisements. The mean number of Google Ads in Australian Google when

Table 1: List of keywords used in the research

| Keyword Group 1 | Keyword Group 2 |
|------------------------------|----------------------------------|
| Sports tracker (E) | Health and fitness app (G) |
| Activity tracker (E) | Fitness app (G) |
| Running distance tracker (E) | Healthy living app (G) |
| Gps track run (E) | Sports tracker app (E) |
| Fitness tracker (E) | Activity tracker app (E) |
| Training tracker (E) | Running distance tracker app (E) |
| Workout tracker (E) | Gps track run app (E) |
| | Fitness tracker app (E) |
| | Training tracker app (E) |
| | Workout tracker app (E) |
| | Mental training app (M) |
| | Meditation app (M) |
| | Healthy eating app (D) |
| | Losing weight app (D) |
| | Diet app (D) |

searching on a desktop reached 3.55. The median value 4.00 can be interpreted as in most cases, there were four Google Ads displayed when searching for a keyword from the list in Table 1. Most of the ads promoted websites offering downloads of multiple mobile applications, websites of application development platforms, fitness training programs, or gyms; however, mHealth apps were advertised only occasionally, with only two of the 78 Google Ads promoting an mHealth app. In one of these cases, the website of the mHealth app was promoted, and a link to the App Store was displayed in the other. The number of Google Ads on mobile platforms was lower (38), with a mean value of 1.73 and a median of 2.00.

In organic search results, more links to mHealth apps were included. Of the 220 positions in Australian Google on desktop, 74 were linked to an mHealth app, which means that, in 33.6% of cases, the positions were occupied by one of the four types of SERP results containing an mHealth app. Most of these SERP results were found in the exercise and training category (E), which was expected due to the largest number of keywords in this category (Table 2). Calculating the mean and median values (Table 3) showed that the mental health category had a comparable density of SERP results linking to an mHealth app. The highest mean number of these SERP results was in category M (4 of 10), while category E had the highest median value (4 of 10).

Most of the SERP results directly related to an mHealth app were linked to an App Store of one of the four platforms (59.5%), followed by links to a dedicated web page of the app (29.7%). The detailed results are presented in Table 4.

SERP pages for all other keyword/location/platform combinations were collected in a similar way, analyzed individually, and summed up to produce further relevant results. There were significant differences between the number of SERP results linked to mHealth apps in Australia and Slovakia. The websites of the majority of mHealth app developers were not localized into the Slovak language, and thus, they could not rank when searching for the keyword in Slovak. Similarly, social media profiles were not translated into English. The only relevant SERP results linked to the App Stores, where, in most cases, the app descriptions were translated by a robot and therefore were missing some parts of the keywords that were included in the manual translation by the authors. Furthermore, for

Table 2: Total occurrences of mHealth apps on the first SERP for Google AUS desktop

| Keyword group/area | G | E | M | D | Total | Maximum |
|--------------------|---|----|---|---|-------|---------|
| Keyword Group 1 | - | 25 | - | - | 25 | 70 |
| Keyword Group 2 | 7 | 28 | 8 | 6 | 49 | 150 |

Table 3: Average occurrences of mHealth apps on the first SERP for Google AUS desktop

| Keyword group/area | G | E | M | D | All |
|--------------------|------|------|------|------|------|
| Mean | 2.33 | 3.79 | 4.00 | 2.00 | 3.36 |
| Median | 1.00 | 4.00 | 2.00 | 2.00 | 3.50 |

Table 4: Frequencies of mHealth apps on the first SERP for Google AUS desktop by SERP result type

| SERP result type | Frequency | Share (%) |
|--|-----------|-----------|
| Link to app website (W) | 22 | 29.7 |
| Link to third-party download site (T) | 4 | 5.4 |
| Link to social media profile/ content (S) | 4 | 5.4 |
| Link to app in the App Store (A) | 44 | 59.5 |
| Total | 74 | 100.0 |

these reasons, the apps listed in SERP results in Google SVK were typically different to those shown in Google AUS.

Twenty-seven mHealth apps were visible in Google AUS desktop. Of these, only five were listed in the Google SVK desktop search, with another 20 shown in Google SVK desktop. The structure of SERP results linked to mHealth apps was different in Google SVK, with the majority of the results linking to the App Store. In Google AUS mobile, 54 apps were listed in the first SERP page. The complete results are summarized in Table 5.

The competition in search was significantly lower in Google SVK, with a total of 71 SERP results relevant to an mHealth app compared to 180 in Google AUS. No links to third-party download websites or social media profiles were displayed in the analyzed SERPs, with only one result linking to the website of an mHealth app. To compare the overall situation in Australia and Slovakia, the authors calculated correlations between subtotals of SERP results relevant to an mHealth app or each keyword within each of the two keyword groups for both desktop and mobile platforms. As can be seen from Table 6, the correlation coefficient was positive for both keyword groups when searching on desktop platforms. Therefore, a similarity can be detected in the data, as with both values being close to +0.3, there is a weak positive linear relationship. On mobile platforms, the very low negative correlations suggest that there is a weak negative (or no linear) relationship between the data sets. Therefore, the situation in Slovakia does not copy the one in Australia as the two markets are different.

The frequencies of SERP results of all four types relating to each mHealth app were added to determine which mHealth apps were most frequently featured in the top 10, and thus, their visibility in search was the highest. On desktop devices, the sports tracker app was displayed most commonly in the SERPs (13 times), followed by running distance tracker +. Most of the apps had only one SERP result for all keyword/location combinations, while 21 apps had two or more SERP results. On mobile devices, the Runtastic app had the highest number of search results in SERPs for all keywords - 10, all of them being organic and linking to App Store download pages. The Lifesum app had the second highest frequency of SERP results in the top 10, with seven of them being paid (PPC). The sports tracker app had the highest number of results on one SERP - 7 of 10 - when searching for the keyword "sports tracker" in Google AUS mobile. These included three links to a company's own app page, three links to the App Store, and one link to a social media profile. Most of the apps had only one SERP result

Table 5: Frequencies of mHealth apps on the first SERP by SERP result type

| SERP result type | Google AUS desktop | Google AUS mobile | Google SVK desktop | Google SVK mobile |
|--|--------------------|-------------------|--------------------|-------------------|
| Link to app website (W) | 22 | 17 | 0 | 1 |
| Link to third-party download site (T) | 4 | 0 | 0 | 0 |
| Link to social media profile/content (S) | 4 | 2 | 0 | 0 |
| Link to app in the App Store (A) | 44 | 87 | 34 | 36 |
| Total | 74 | 106 | 34 | 37 |

Table 6: Analyzing the differences between Australia and Slovakia

| Platform | Keyword Group | Correlation |
|----------|---------------|-------------|
| Desktop | 1 | 0.285 |
| | 2 | 0.327 |
| Mobile | 1 | -0.189 |
| | 2 | -0.027 |

for all keyword/location combinations, while 31 apps had two or more SERP results when searching on mobile devices.

Of the 880 possible SERP results analyzed (all keyword/location/platform combinations), the following three applications were listed the most:

1. Sports tracker (25).
2. Runkeeper (15).
3. Google fit (15).

Runkeeper was also featured as one of the top 10 most downloaded apps in the iTunes store as per October 2017. It is surprising that some of the most popular health and fitness apps were not very visible in search, including Endomondo, which had only one SERP result on desktop and two on mobile platforms. The Strata app was not visible on desktop platforms at all; however, it had five paid results and one organic result on mobile platforms.

5. Theoretical and Practitioner Implications

The results presented in this paper enhance the literature by creating a methodology for assessing the search engine visibility of mobile applications where various types of SERP results are taken into account. This methodology expands the traditional approach of measuring search visibility by analyzing only the links to a company's website. It is universal and can be adapted to fit different segments. The research has also shown that the competition in search results for the exercise and training and mental health applications is more intense than in the SERPs for keywords from the general and healthy eating/diet categories. By documenting the situation in applying the promotion in search engines in Australia and Slovakia, the authors also indicate that there can be significant differences between the level of promotion and competition in SERPs in different countries. This can be explored further by subsequent theoretical and empirical studies.

The practitioner implications of the paper can be summed up as follows:

- The competition in the SERP related to mHealth apps from the Health and Fitness category is significantly lower in Slovakia than in Australia. This could represent an opportunity for companies developing mHealth apps to target this market and similar smaller local markets by translating their websites and optimizing the translations in App Stores.
- There are many ways to increase the visibility in search focusing on each of the four types of SERP results analyzed; companies can embrace all of them to create a well-balanced search profile.
- Optimized web pages of mHealth apps can drive traffic from search while linking to download pages in App Stores from them. Only a few apps had their web page visible in the first SERP page, which represents an opportunity to work on onsite and offsite SEO.
- Dedicated pages/profiles on third-party websites offering downloads of the app can rank higher in the SERP because of their general recognition and history. The companies developing the mHealth apps were not using their potential sufficiently, however.
- Social media profiles and videos can also rank in the top 10, adding more chances to be included in the first SERP or having more links on this page to get conversions.
- Direct links to the app page on selected App Stores represent the most frequent type of SERP results related to mHealth apps. Therefore, it is necessary to optimize the profile on the App Stores by including relevant keywords in the app description to rank in these types of SERP results. The advantage is that this type of SERP results also enables direct downloads of the app when searched from mobile devices.
- Only a few applications were visible in paid results; this creates an opportunity for other companies to include PPC in their marketing mix to increase the visibility of their apps instantly. The ads can drive traffic to the app page in App Stores and the web page of the app.

6. Discussion

The authors have identified opportunities for subsequent research studies to define the relationships between different markets and explore opportunities for the promotion of mHealth applications in other

digital channels. Applications from other mHealth categories can be included in the research to expand the data sample. Using additional locations may help to discover patterns of search visibility and the relatedness of different markets. This can open avenues to establish a strategy for visibility in search that would reflect similarities and differences between more markets. Individual mHealth applications that exhibited above the average search visibility can be further analyzed to identify the roots of their positive results and study the complexity of their promotion using other tools and media.

7. Conclusion

Companies are using different methods to promote their mHealth apps. The analysis of 880 SERP results showed that the competition in search varies across the platforms and locations. Opportunities for companies striving to increase their search visibility were identified. By embracing the strategy of using various types of web pages to enable or link to the download of the mobile application, the company increases the chances of being included in the top 10 search results for more keywords, thus increasing the number of application downloads.

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