
Identifying key performance indicators for marketing strategies in mobile applications: a systematic literature review

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Abstract: In practice marketing can and should play an important role in mobile applications when formulating marketing strategies. The aim of this article is to identify the main KPIs to measure the effect of marketing strategies in mobile applications. To achieve this goal, we carried out a systematic literature review (SLR) on the topic of mobile applications and marketing strategies. The search terms consulted in the databases were KPIs, marketing and mobile applications obtaining a total of $n = 1,088$ studies. The databases consulted to extract data were Scopus, PubMed, PsycINFO, ScienceDirect and Web of Science. The results obtained in this research were the identification, development and analysis of the main quantitative and qualitative KPIs to measure the effect of marketing strategies in mobile applications. Furthermore, we name the main scientific journals developing further studies on this subject, as well as on the most relevant topics within the industry. The results of the research can be used to enhance mobile APP marketing strategy analysis and thus, enhance their development, both in the scientific and the professional sectors.

Keywords: mobile applications; marketing strategies; key performance indicators; KPIs; apps; marketing metrics.

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1 Introduction

The introduction of smartphones, with the launch of the first iPhone more than ten years ago, and the constant engagement generated towards mobile apps, have made it possible for this industry's growth rate to multiply (Freierman, 2011). According to a Pew Research Centre Report "nearly two-thirds of Americans own a smartphone, and 19% of Americans rely, to some degree, on smartphones to access online services and information" (Smith, 2015). In fact, more and more students are not just mobile-first, but are mobile-only (DubLabs, 2016; Kolbeck, 2018). The numbers show the expansion will not stagnate any time soon. It is expected for over 2 billion more people to be active mobile device users by 2021. The proliferation of mobile application development can only be expected to continue as smartphone usage grows globally (Rakestraw et al., 2012; Pentina et al., 2016).

In 2014, an estimated 60% of internet traffic came from mobile devices, out of which 51% was attributed to applications. A mobile app is a software used on a mobile device

(Koljonen, 2016). A type of application software designed to run on a mobile device (Schneiderman, 2011; Gaviria De La Puerta and Sanz, 2017) like a smartphone or tablet. Apart from the concept mobile app and its definition, there are plenty of related terms that must be understood to correctly comprehend the context in which it develops (Table 1). Mobile apps must be downloaded from a mobile store to a mobile device which can be a smartphone but can also be a tablet or a smartwatch. These devices inherently include what is known as an operating system (OS).

The execution of the strategy is frequently difficult and always critical to achieve success. Executives should really consider using strategic performance measurements in which the election of the right metrics to track efficiency plays a key role to implement it successfully (Chandrashekhar et al., 2017). One of the main concepts that will be studied throughout this research is key performance indicators (KPI); which play an important role when formulating marketing strategies, both in digital marketing and marketing for mobile apps (Mitchell et al., 2017; Ntalkos et al., 2015; Chang et al., 2016; Lee et al., 2018; Kim and Baek, 2018). Understanding and adequately managing the main metrics and KPIs to increment digital marketing strategy effectiveness is a must (Saura et al., 2017).

Existing metrics are often difficult and impractical for most marketers to successfully implement them (O'Sullivan and Butler, 2010) in mobile application focused strategies (Pantano and Gandini, 2017; Hur et al., 2017). Added to the difficulty associated with implementing marketing metrics, is the lack of consensus (Davies and Ardley, 2012; Lin and Chen, 2013) about which metrics should be used in each of the devices. Despite these difficulties, marketing metrics are still a priority for organisations, with marketing surveys carried out to executives showing more than 90% viewed marketing performance metrics as a significant priority (Stewart, 2009; Gaskill and Winzar, 2013).

Koljonen (2016) underlines the importance of implementing marketing strategies in mobile apps, while Seggie et al. (2017) point the direction towards mediation. On their end, Catolino et al. (2017) and Gomes et al. (2016) analyse specific metrics that must be used specifically for mobile apps.

It is imperative to measure and optimise performance (Duane et al., 2016; Cho, 2016; Hébert et al., 2017; Frank et al., 2018) in campaigns carried out in mobile devices, as well as those implemented in other digital channels. Nevertheless, metrics cannot be the same because the user's behaviour towards their mobile devices is not the same as towards other devices (Wu et al., 2017; Hsiao et al., 2016). Even though there are studies which analyse KPI's importance in mobile environments (Khetrapal and Sandhu, 2009; Leisenberg, 2016), a gap has been discovered in previous literature, of information which identifies metrics specifically useful in mobile apps strategy (Khetrapal and Sandhu, 2009; Saura et al., 2017; Leisenberg, 2016).

Hence, the main goal of this research is to underline the KPI's importance when measuring strategies in mobile apps. Now we proceed to identify which are the main analytical KPIs to measure marketing strategies efficiency in mobile apps.

In the first place, we will introduce the related work section, where we will showcase previous studies in which KPIs were identified to measure strategic efficiency in mobile devices. Next, we will add the methodology section in which we will develop the methodological framework. Finally, we will present the resulting analysis, discussion and conclusions.

1.1 *The importance of the mobile applications industry for marketing*

It is expected that the global mobile app market will have an estimated value of 6.3 trillion dollars in 2021. Considering its value in 2016 was 1.3 trillion dollars. Growth and development projection expected in the vibrant mobile app market is exponential (Appannie, 2017). Currently, we are experiencing a change in the global paradigm, (Giovannardi and Lucarelli, 2018; Hsiao and Chen, 2016; Roma and Ragaglia, 2016), with thousands of clients shifting from physical transactions to mobile (Zhao and Balagué, 2015; Stocchi et al., 2017; Arora et al., 2017). For example, the giant Alibaba (2017) announced in 2017; the value generated by mobile transactions was 79% while in 2016 it was 65%.

It is certainly generating great global opportunities for companies (Salo, 2017; Shankar et al., 2016; Veríssimo, 2017) from various sectors, whose common ground is mobile apps and related activities (Gartner, 2016).

A deeper analysis of mobile application behaviour and scope is necessary to understand the existing differences for different types of products (Hubert et al., 2017) or category (Papadakis et al., 2018).

Furthermore, aiming to assume the intrinsic relevance of mobile apps for marketing as an industry in and of itself, we can dive deeper into the importance mobile apps have and if they measure the strategies through KPIs in that category of application. The Apple app store (Lee and Raghu, 2014) is a platform used by many users to search for and download apps for their Apple devices. Until June 2017, 180 billion apps were downloaded from the app store.

The most popular app category is games, which sums up a total of 23% of total download. Games are also one of the categories with the highest level of user participation in mobiles. In June 2016, they occupied 88% of the time of the total time spent playing digital games. In January 2018 business mobile apps was the second most popular category with over 9.8% out of all downloaded mobile apps available based on Lee and Raghu (2014) (Table 1), closely followed by the education category (Papadakis et al., 2018). Lifestyle and entertainment complete the top five lists of the best apps for iOS. These last two, lifestyle and entertainment, have a broad reach in the market, both reaching 63% out of all iOS global mobile users since December 2016.

Furthermore, it is important to point out the importance of having a strategic approach when developing a mobile app (Lupton and Pederson, 2016; Price-Haywood et al., 2017), being also advisable to implement a marketing plan for the mobile app (Koljonen, 2016). According to Kotler (2016), one of the key steps which guarantee the achievement of the goals of a company in a digital environment is strategic control of relevant analytical indexes for consumers and users (Genc-Nayebi and Abran, 2017).

On their end, Järvinen and Karjaluoto (2015), analyse digital marketing techniques in web pages and mobile applications to understand which factors to measure to obtain conversions. Kannan and Li (2017) focus on user interface design for mobile applications to increase conversions. On the topic of business models, there are three ways of monetising the activity carried out in mobile applications: App stores or stores were applications are bought or downloaded, mobile app advertising (Cheung and To, 2017) and m-commerce or mobile commerce (AppAnnie, 2017).

Table 1 Percentage of active apps in each category

<i>Posición</i>	<i>Categoría</i>	<i>Description</i>	<i>Percentage of active apps</i>	<i>Download source</i>
1	Games	Interactive game apps for the smartphone.	25.02	App store
2	Business	Tools for business management.	9.8	App store
3	Education	Basic, specialised education and language applications,	8.49	App store
4	Lifestyle	Design, style and fashion apps	8.32	App store
5	Entertainment	Pass times and entertainment tools.	6.05	App store
6	Services	Services related to shipments, professional tools and others.	4.95	App store
7	Travels	Tour guide and travel inquiry applications.	3.9	App store
8	Fitness and health	Tools to monitor health and fitness exercises.	3	App store
9	Bookings	Hotel, restaurant, etc. bookings.	2.99	App store
10	Food and beverages	Recipes, food education and sales.	2.89	App store
11	Productivity	Tools developed for professional productivity.	2.63	App store
12	Music	Listen to music and videos.	2.51	App store
13	Finance	Finance, economy and stock market.	2.25	App store
14	Photo and video	Video, photo and multimedia editing.	2.21	App store
15	References	References for education and research.	2.19	App store
16	Sports	Sport monitoring services and activity follow up.	2.17	App store
17	Social media	Apps for social relations.	2.11	App store
18	News	Newspapers.	1.96	App store
19	Doctors	E-health apps to monitor health and illness.	1.85	App store
20	Shopping	Mobile applications to purchase products and services.	1.33	App store

Considering economic growth of the mobile APP market is based on its own commercial activity, whether through downloads, advertising or m-commerce, it is imperative to use digital marketing techniques and their adaptation to the new mobile app environment (Palos-Sanchez and Saura, 2018). This need multiplies its relevance because it is a fast-growing market (Atkinson et al., 2018; Wang et al., 2018; Wottrich et al., 2018; Gu et al., 2017; Frey et al., 2017) where demand overweighs offer, as we previously stated, thus making it necessary to establish certain criteria which can help evaluate the adjustment of the measuring principals of mobile app marketing strategies.

2 Related work

Traditional marketing techniques have evolved onto new marketing techniques in which potential clients would be considered as users (Genc-Nayebi and Abran, 2017), people who will buy or use products and services in the internet, understanding the user as a prosumer, content creator who interacts with the brand in the internet (Palos-Sanchez et al., 2018).

Even if there are previous studies which identify which KPIs should be used in digital environments, (Seggie et al., 2017; Li, 2011; Järvinen et al., 2012; Choudhary et al., 2017; Nabout et al., 2012), there are few researches which focus on considering specific KPIs necessary when initiating and evaluating marketing campaigns in mobile apps.

KPIs play a crucial role in marketing strategies formulation, both in digital marketing and in marketing implemented in mobile apps (Thornton et al., 2017; Dickinson et al., 2015; Harding et al., 2016; Mirzaei et al., 2018; Chen, 2017; Hsu and Lin, 2016; Rese et al., 2017; Dacko, 2017). Understanding and managing the main metrics and KPIs adequately is necessary to increase effectiveness in their digital marketing strategies (Saura et al., 2017).

Leisenberg (2016) underlines the importance developing a resource which allows monitorisation of different metrics within the application (Okumus et al., 2018; Rodriguez-Sanchez and Martinez-Romo, 2017; Suki and Suki, 2017; Going Global, 2015; Hurwitz et al., 2016). This is closely related to the development of the code because without it, we would not be able to measure, for example, the number of unique sessions.

Table 2 KPIs for mobile devices

<i>Key terms</i>	<i>Doncel (2010)</i>	<i>Leisenberg (2016)</i>	<i>Catolino et al. (2017)</i>	<i>Mopub (2017)</i>	<i>Saura et al. (2017)</i>
Engagement and usage	√	√	√	√	-
Lifetime value	-	√	√	√	-
Customer loyalty	√	√	-	-	-
Active users	-	√	√	-	√
Impressions	-	√	√	-	√
Customer journey	-	√	-	-	-
CPM	√	-	-	√	-
CTR	√	-	-	√	-
Fill rate	-	-	-	√	√
Revenue per visitor	√	-	√	√	-
Conversion	√	-	-	-	√
Traffic	√	-	-	√	√

In Table 2, we have included the main metrics proposed in the researches, identified in the analysis of studies related to this research (Doncel, 2010; Leisenberg, 2016; Saura et al., 2017; Catolino et al., 2017) and which will allow for an optimisation of mobile marketing:

In the study by Saura et al. (2017), the following metrics (see Table 3) are pinpointed as specifically applicable in digital environments such as mobile apps.

Table 3 KPIs for mobile applications based on Mopub (2017)

<i>KPIs</i>	<i>Description</i>
CPM	Cost per thousand impressions
CTR	Click-through-rate is the number of users that click on a link compared to the number of total users
Fill rate	The number of total ads in a website compared to the effective ads that were filled
Engagement	Interaction between the company and its on-line community
Revenue per visitor	The amount of money generated by a visitor

Considering KPI classification and its importance, we analysed the specific literature which allows not only to identify which are the most important KPIs, but also achieve a better understanding of the current situation in marketing implemented through mobile apps.

3 Methodology

To identify the main quantitative and qualitative KPIs to measure marketing strategy efficiency in mobile apps and develop the research, we carried out a systematic revision of the literature on the topic following the works of Rahim et al. (2015), Charband and Navimipour (2018) and Alyari and Navimipour (2018). Next, we will explain how the methodological method is developed.

To increase the quality of the systematic revision we have followed each of the steps proposed by the Prisma (2018) checklist.

3.1 Data extraction

To carry out the scientific study of mobile app marketing strategy measurements through KPIs, the databases consulted to extract the data were Scopus, PubMed, PsyINFO, ScienceDirect and Web of Science. The process was confirmed by different authors of the research. The queries were carried out for English articles and no other filters were applied between 2008 and 2018. When consulting the data bases mentioned previously we used Boolean AND y OR operators to optimise the results of the database on the subject of

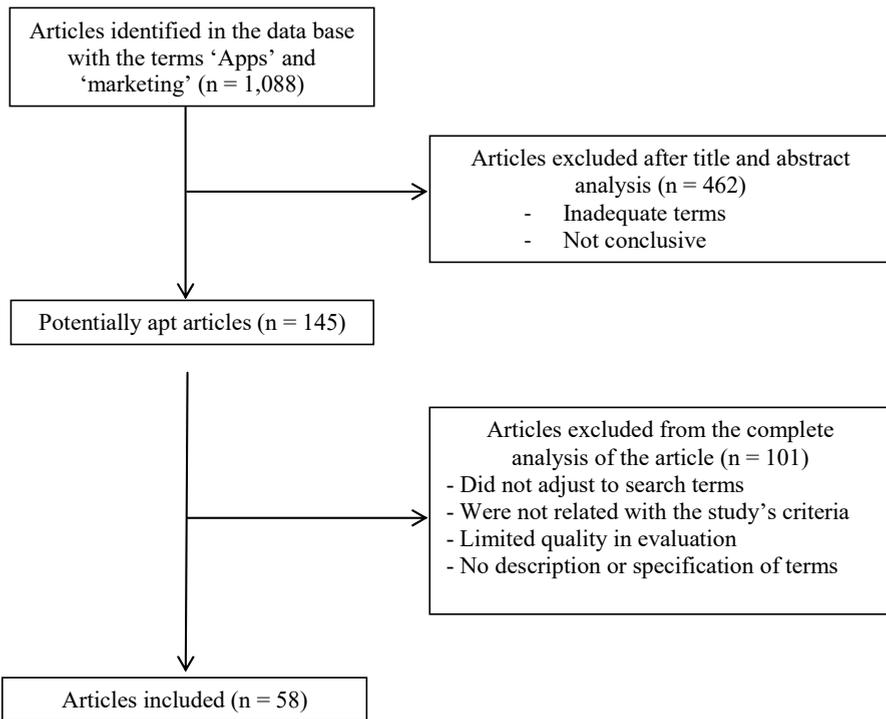
- 1 apps
- 2 marketing.

The search terms selected are presented in Table 4.

Table 4 Search terms selected in the research

<i>Marketing y apps</i>	<i>Related concepts about KPIsç in mobiles apps</i>
'Marketing mobile'	'Marketing'
'Marketing mobile in apps'	'Strategies'
'Marketing and mobile applications'	'Mobile'
'Internet mobile'	'Apps'
AND-OR	'Revenue per visitor'
'Marketing apps'	'Revenue per page'
'Digital applications'	'Unique users'
'Mobile applications'	'CTR'
'Mobile apps'	'CPM'
	'Engagement'
	'Measurement'
	'Performance'
	'KPIs'
	'Metrics'

Figure 1 PRISMA 2009 flow diagram



The title and abstract of this article have been individually analysed by each one of the researchers to determine if the articles are adequate to continue with the systematic literature revision. Those articles duplicated in the search were excluded. All the articles gathered in this study have been individually analysed. The criteria used is based on AMSTAR (Figure 1) tools to incorporate only high-quality abstracts. Even though initially the AMSTAR tool was designed to measure the quality of articles in relation to their abstracts, we followed the criteria to measure suitability (Saura et al., 2017) of the research.

The goal is to collect the broadest amount of evidence through results based in quality studies. Some of the variables used in AMSTAR to evaluate quality of systematic revision are, first and foremost, that the relation of the research questions criteria included in the study, data extraction was carried out by two independent researchers, quality of the revised documentation, identification and definition of concepts, and quality of references used throughout the study. As Bosch and Sang (2017) propose we have included the following criteria to develop a methodology:

- systematic revision of abstracts (meta-analysis)
- include structured evaluations of the study
- written in English
- conclusions and research on topics directly related with mobile applications (apps) and marketing.

In the first phase, we identified the databases and the search terms, obtaining a total number of $n = 1,088$ samples. In the second phase, after each article individually, a total of ($n = 462$) articles were excluded from the initial sample due to the fact their topics differed from the subject of study and where thus inadequate. Consequently, in the third phase of the systematic revision we obtained a total sum of $n = 145$ articles potentially adequate. In spite of that, after applying the discriminatory process of: It does not match the search terms; it does not have an explicit relation with the object of study; low-quality researches in the evaluation in which description and specification of the terms is missing, the sample ends up a total sum of $n = 58$ articles.

4 Exploratory analysis of results

To carry out a scientific metric analysis we studied journals which had published the 58 articles included in the systematic revision and were organised by the number of articles, the quartile of the journal and the category they are in.

The research carried out during the last years is categorised into ten main topics which are: clinical medicine, social science, computer science, environment-ecology, mathematics, economy and business, engineering, psychiatry psychology, economics and econometrics-marketing, sports sciences.

The total numbers of studies selected after successfully passing the quality filters developed in the systematic revision can be appreciate in Table 5. Moreover, this table also shows the quality of the scientific journal introducing the classification in quartiles.

Table 5 Scientometric analysis

<i>Journal</i>	<i>Total</i>	<i>Quartile</i>	<i>Category</i>
<i>Telematics and Informatics</i>	6	Q1	Social science-general
<i>Computers in Human Behaviour</i>	4	Q1	Psychiatry, psychology
<i>Decision Support Systems</i>	3	Q1	Computer science
<i>Technological Forecasting and Social Change</i>	3	Q1	Social science-general
<i>Electronic Commerce Research and Applications</i>	2	Q1	Economy and business
<i>Future Generation Computer Systems</i>	2	Q1	Computer science
<i>Journal of Business Research</i>	2	Q2	Economy and business
<i>ACSMS Health and Fitness Journal</i>	1	Q4	Sport sciences
<i>Addictive Behaviours</i>	1	Q1	Psychiatry, psychology
<i>Australian and New Zealand Journal of Public Health</i>	1	Q2	Social sciences-general
<i>Australasian Marketing Journal (AMJ)</i>	1	Q2	Economics and econometrics, marketing
<i>Business Horizons</i>	1	Q3	Economy and business
<i>Computers and Education</i>	1	Q1	Computer science
<i>Computer Methods and Programs in Biomedicine</i>	1	Q1	Computer science
<i>Current Opinion in Psychiatry</i>	1	Q1	Psychiatry, psychology
<i>Econtent</i>	1	Q4	Social sciences-general
<i>Empirical Software Engineering</i>	1	Q2	Computer science
<i>Expert Systems with Applications</i>	1	Q1	Engineering
<i>IEEE Signal Processing Magazine</i>	1	Q1	Engineering
<i>International Journal of Information</i>	1	Q1	Social sciences-general
<i>Internet Research</i>	1	Q1	Computer science
<i>International Journal of Hospitality Management</i>	1	Q1	Social sciences-general
<i>International Journal of Research in Marketing</i>	1	Q2	Economy and business
<i>International Journal of Medical Informatics</i>	1	Q1	Clinical medicine
<i>Industrial Marketing Management</i>	1	Q2	Economy and business
<i>Journal of Systems and Software</i>	1	Q1	Computer science
<i>Journal of Air Transport Management</i>	1	Q3	Social science-general
<i>Journal of Advertising Research</i>	1	Q3	Economy and business
<i>Journal of Marketing</i>	1	Q1	Economy and business
<i>Journal of Management Information Systems</i>	1	Q1	Computer science
<i>Journal of Interactive Marketing</i>	1	Q1	Economy and business
<i>Journal of the American Board of Family Medicine</i>	1	Q1	Clinical medicine
<i>Logic Journal of the IGPL</i>	1	Q4	Mathematics
<i>Population Health Management</i>	1	Q3	Clinical medicine
<i>Public Relations Review</i>	1	Q2	Social science-general
<i>Pervasive and Mobile Computing</i>	1	Q2	Computer science
<i>Public Health</i>	1	Q2	Social science-general

Table 5 Scientometric analysis (continued)

<i>Journal</i>	<i>Total</i>	<i>Quartile</i>	<i>Category</i>
<i>Research in Social and Administrative Pharmacy</i>	1	Q2	Social science-general
<i>Soft Computing</i>	1	Q2	Computer science
<i>Sustainability</i>	1	Q3	Environment-ecology
<i>Transport Policy</i>	1	Q1	Social science-general
<i>Transportation Research Part A-Policy and Practice</i>	1	Q1	Social science-general
<i>Women and Birth</i>	1	Q1	Clinical medicine
<i>Total</i>	58		

To develop the exploratory analysis and select the main quantitative and qualitative KPIs to measure efficiency of marketing strategies in mobile apps we used VOS viewer software to construct and visualise bibliometric networks. In Figure 2, we can see the main nodes and thematic connections of the last ten years of researches in this sector, from 2008 to 2018.

Table 6 Quantitative KPIs to measuring marketing strategies in mobile applications

<i>Quantitative KPIs</i>	<i>Description</i>
Ratings	The ratings allow users to rate between 1 and 5 stars according to the level of satisfaction towards the app and its features. It is a quantitative indicator for marketing because it reflects users satisfaction towards the app.
User reviews	A review is a written response where users leave feedback. They can be positive or negative. App platforms are starting to use text analysis software to determine their quality and volume.
Installs volume	The volume of app installations which can be different from those uninstalled. It reflects, among other marketing factors, the acceptance of the apps user experience
Traffic	The total number of users which have used the app at a given time.
Time spent per visit	Total amount of time users spend in the app when using it. Determines among other marketing factors, interest and user habits within the app.
Unique users	Total amount of unique users the app has in a given period of time. This KPI allows the quantification of total users depending on their temporal horizons.
Total of downloads	It quantifies the total number of app downloads and it differs from the total number of uninstalled.
Conversion rate	Measures the total number of goals achieved within an app. Marketing must measure each one of them to calculate effectiveness of the campaign.
Installs per keyword	Measures install as depending on the keyword searched in the app store.

As it can be observed, the analysed and presented studies in the systematic literature revision develop different concepts and metrics to measure marketing efficiency in mobile applications. To identify each one of the KPIs we present below we filtered the queries in the data matrix identifying those nodes which contain qualitative and quantitative KPIs (Saura et al., 2018b). Below we define and classify them by importance and volume of the node represented in the bibliometric analysis in relation to the amount of KPIs taking place in this analysis (Saura et al., 2018a). In Table 6, we can observe the results of the quantitative KPIs obtained as a result of the research:

Moreover, as a result of the bibliometric analysis and the process of systematic literature revision we identified the following qualitative KPIs to measure marketing strategy efficiency in mobile apps.

Table 7 Qualitative KPIs for measuring marketing strategies in mobile applications

<i>Qualitative KPIs</i>	<i>Description</i>
App name/title	The name or title which appears in the app store. Some names include the key word and improve their visibility when users search an app by category
Screenshots	Screenshots in the apps in the app store. Visually show the main functionalities of the app and can serve as call to action so users download the app.
Icon	The icon of the app. Can call the users attention, were colours and shape are very important.
Feature graphic	Each of the graphic components of the app can attract users' attention and improve visibility.
Type of registration	The type of register made by users and its analysis can help marketing increment the understanding of each user and their behaviour in the app.
The flow of users	The study of how users behave in the app. Step by step analysis of each diagram of user actions from the moment they open the app.

5 Discussion

The results of the study have identified the main quantitative and qualitative KPIs to measure marketing strategy efficiency in mobile apps. Resulting from the systematic revision of the literature we identified those key indicators to measure efficiency in marketing strategies for mobile applications correctly.

We found the main studies based their researches in the definition and measurement of quantitative factors such as ratings, user reviews, volume of installations, traffic, time spent per visit, unique users, total downloads, conversion rate and installs per keyword. These are the indicators researchers and professionals in the sector must follow to quantify the measurement of marketing strategy efficiency in mobile applications.

Thus, as a result of the research we identified the main qualitative KPIs to measure efficiency of marketing strategies in mobile apps are app name/title, screenshots, icon feature graphic, type of registration and the flow of users. The identification of these factors can be used to help researchers focus their attention on the possibility of quantifying them as well as help professionals develop creative strategies which can help make the perception of each of the qualitative KPIs identifies better.

Moreover, we identified the main scientific journals in which scientists are publishing their research on this topic. Researchers and professionals who want to focus their attention on this industry must consult the selected journals.

6 Conclusions

The mobile application sector has grown exponentially in recent years. Alongside the development of new technologies such as geolocalisation or the improvement of 3G and 4G coverage of mobile phones are becoming indispensable in the daily use of these devices. It is important to underline the importance of measuring strategies developed for mobile apps with the use of KPIs just like efficiency is measured in other categories digital marketing strategies, because the behaviour of mobile app users on their devices differs from the behaviour on their desktop computers, making it necessary to use specific metrics for each one. In this sense, the results obtained are relevant both for academics and marketers.

6.1 *Implications for academics*

The results of the research identify the main quantitative and qualitative KPIs to develop measure and analyse marketing strategies in mobile applications. Therefore, mobile apps have received attention from the scientific community but also from the users. The scope and development of studies focused on mobile apps is not more than a decade old, just like the industry itself, due, among other factors, to the development itself of the technology associated to this sector. In this study we have identified the main scientific journals publishing studies on the subject in the last few years to acquire a global perspective of study trends, topics worked on and sectors which the scientific community have stated an interest.

The marketing researchers who want to continue with this line of research can focus on identifying the KPIs developed as a result of this research to improve the theoretical framework of this study and make it possible to identify other KPIs in mobile apps.

Moreover, this study can be used by researchers to increase scientific relevance in the mobile app sector and its measurement through the use of KPIs.

6.2 *Implications for marketers*

Mobile apps have received the attention of users and professional marketers. Mobile apps and the attention offered by users in each of the categories identified in this research reinstate the user's interest in this industry.

Marketing sector professionals must focus on identifying the KPIs developed as a result of this researches to improve their applications and make it possible to identify the other KPIs in the professional sector. Marketing tactics and activities developed in mobile apps are relatively new and still need to improve.

Professionals can use the results of the research to improve efficiency of their marketing strategies in mobile apps and, most importantly, their analytical measurement and monetarisation methods. With the use of the identified KPIs marketing strategies for mobile apps can be monitored to measure their effectiveness, thus bettering the professional services marketers can carry out in this sector.

The limitations in this research are those related to the number of articles consulted, the results of the exploratory analysis and the number of years of research analysed.

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