USER BEHAVIOUR ON GOOGLE SEARCH ENGINE

BARTOMEU RIUTORD FE

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE GRADUATE SCHOOL

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MASTER OF BUSINESS ADMINISTRATION

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Abstract

The objectives of this study are (1) to analyse the relationship between the users knowledge about Google search engine and the position of the websites that they visit on it, and (2) to learn how the user access to Pay Per Click links according to their knowledge about them.

Research methodology: The sample consisted of 120 Spanish people from Palma de Mallorca who have been evaluated through a questionnaire to define their knowledge about Google search engine and then with an analysis of the position of the websites visited on 4 different searches using it.

Research findings were as follows: (1) There is a relationship between the users knowledge and the position of the websites visited by them on the Google search engine. (3) Users with low Google search engine knowledge tend to click on links in top positions in the organic search results (Pearson r=0,706) (2;3) and on Pay Per Click links (Pearson r=-0,358) with more incidence than users with high knowledge.

Keywords: Search, Engine, Optimization, Marketing, SEO, SEM, Google, Behaviour, User.

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CHAPTER 1
INTRODUCTION

1.1 Introduction of the study

Our society is changing very fast. The way the people live is getting hardly influenced by Internet and specifically by the search engines that we find on it. On the other hand, every business and organization wants a presence on the web and they use the search engines to bring traffic to them.

Rehman and Naeem (2013) define the search engine like the process based on different strategies with the main goal to organize the information from the Internet and give it to the users. Nowadays, the most important search engines in the world are Google, Bing, Yahoo, Ask,… and we consider them useful and efficient if they give us the correct information and with a short period of time.

Between all those search engines, Google is the most important one and also one of the most important companies in the world and considerate highly innovative. It was founded in 1998 by Larry Page and Sergey Brin while they were Ph.D. students at Stanford University (USA) and it not only includes a search engine, also a cloud computing, a software, or online advertising technologies…

Google's mission statement from the outset was "to organize the world's information and make it universally accessible and useful" (Tung & Wu, 2013) and they start working with the Google web search, which is the basis of the company and the most-used search engine on the World Wide Web (WWW), handling more than three billion searches each day (Schuster, 2010).

This study will be for a lot of websites businesses that are based in attract users to their websites from the search engines, and specifically from Google. A better understand of their behaviour will help them to improve their techniques, called Search Engine Optimization (SEO) and Search Engine Marketing (SEM) techniques, which have the goal of increase the visibility of the websites. And it is the reason because we are going to focus on the user's behaviour on it.

The research will be made in Palma de Mallorca, a Spanish city from Mallorca, which is an island. The language that we are going to use is Spanish, because we consider that the results will be representative for all the Spanish language users of Google and in a lower way for all the Google users in the world.

1.2 Statement of the Problems

The focal point of the research is to investigate the relationship between the users knowledge about Google search engine and the position of the websites that they visit on it.

We can divide the position of the websites in 2 different groups. The websites which link are located in the Pay Per Click (PPC) areas, and the websites that have their link in the organic search results area. There are 3 different areas for Pay Per Click links, and between 1 and 3 positions on each area. On the other hand we can find 10 different positions in each page for the websites that have their link on the organic searches area, and the number of pages we can find only depend on the search.

We suspect that according to their knowledge the users will differ on the links they will click. The user with better knowledge should use less links on PPC position and links in positions closer to the bottom of the page on the organic search areas. If we can prove it, and understand in what proportion are they acting, it would be very helpful for webmasters and they could act according to the target group of people of their websites.

If we try to investigate about search engines users' activities is very difficult to find this information because it is stored at the search engine servers and it is not public. There are different ways to analyse those activities. One of them is using an eye tracker like "Tobii T120" how Marcos & González-Care had used in their study (2010) borrowed by Alt 64 Company. Their research was about the behaviour of the user when is using the search engine and recording the data in a processor. The principal problem of this way of study is that eye tracker is very expensive and difficult to get, and finally their results were not that good if we compare it with a manual process, because they just improve with the time and amount of sample, but increase the complexity of the research.

On the other hand Yamin (2013) had studied more than 1000 users through and interface framework to study the Google search engine. The results he got were from a huge data but very generals. He only got conclusions about the dimensions of the user search behaviour, which can do two kinds of queries, breadth search query and depth search query. The study indicates that the users have used in bigger proportion breadth search query in their searching.

After analyse those precedents, we decided to investigate on Google search engine users behaviour in a manual way, which it means with an interview and analysing their searches face to face.

1.3 Research Objectives

1) To analyse the relationship between the users knowledge about Google search engine and the position of the websites that they visit on it.

2) To learn how the user access to Pay Per Click links according to their knowledge about them.

1.4 Theoretical Framework

The website administrator or also called webmaster has different responsibilities on the website or websites that he/she is working on. They should take care about many aspects of the websites, like the design, content… but nowadays they have a new and very important duty which is to attract users from search engines, and because of this they use two different techniques: SEM and SEO (Jain, Iyengar & Arora, 2013). Using those techniques they will get more visitors from search engines, because they are improving the position on it and also the visibility from the users.

Each technique has a different goal. When a search engine returns its search results, it gives us two types of links: organic and Pay Per Click (PPC). Organic search results are also called natural search results, and improving their position on it is what SEO is all about. SEM is about to improve the relation between how much you pay for click to Google and how much money you get from each click from the users (Orense

& Rojas, 2010). So we can summarize that SEO is about free positioning on the search engine, and SEM about paying positioning.

At the moment Google is the most important search engine in the world, and in some countries like in Spain the difference between it and the other search engines is huge. Accordint to Finkle (2011), in 2007, Google had more than one million servers in data centres around the world and they had processed over five hundred million search requests. At the ends of 2013, Alexa, which is a company that values the number of visits for each website, listed google.com as the most visited website in the world and with more than 2 billion searches.

On the other hand we focus on the Google search engine's user. The connection between them and Google can be studied according to how they act on it. Marcos and González-Caro (2010) or Yamin and Ramayah (2011) had studied the relationship between their knowledge about the search engine and search satisfaction of them, concluding that users with higher knowledge got better results on the search engine. In the following study, we want to analyse the relation between users' knowledge and on which position and kind of links they visit, because the knowledge of this relation can help to improve SEO and SEM techniques.

1.5 Conceptual Framework

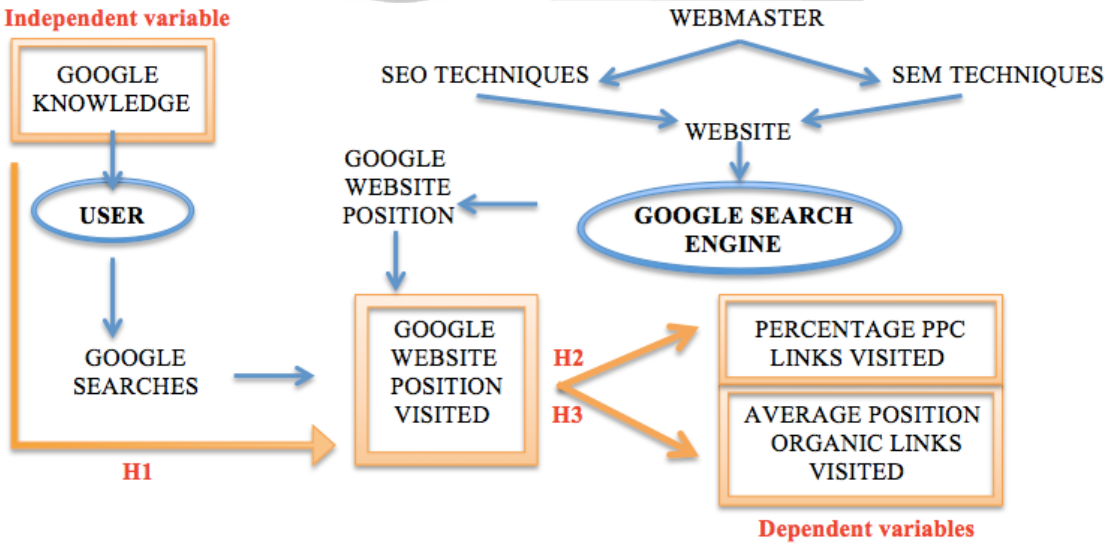

Figure1.1 Conceptual Framework

1.6 Scope of the Research

In this investigation we are going to analyse the relation between what Google search engine users know about it, how often and on which purposes they use it and their behaviour using it (independent variable) respect which links are they visiting (dependent variable). After research about different theories from various studies, we find that search engine results can be a very interesting way to create a brand positioning in the e-commerce (Panda, 2013).

The responders of the study will be people over 14 years old who are living in Mallorca, because are the people on whom we will have access during the thesis, and they should represent the worldwide users of this search engine.

1.7 Limitations of the Research

The research has many limitations, the most important one is that we are just going to interview people who is living in Mallorca, which is an Spanish island, and for that reason their behaviour should not be representative for all the people who is using Google. On the other hand, some of the results of the study will be according to Google in Spanish (google.es) because is the language used by the people from Mallorca to do research.

Also say that to divide the users according to their knowledge, we will propose a questionnaire, which is not proved by other authors, and may not be 100% effective.

On the other hand, we don't have other examples about similar studies, so it will be difficult to compare our results with other researches and it can lead in some problems and limitations.

Another important limitation is the amount of sample that we are going to study. For each user that we will study, we plan to do a questionnaire plus four different search analyses, so takes several work and time, and for this kind of study we cannot exceed in the number of interviewees, so we have to adapt to this aspect.

1.8 Significance of the Study

This study will be highly usefulness for the webmasters who are using SEO and SEM techniques because according to the level of knowledge about Google of their target users, they will adapt their techniques. Smith (2013) says in his research that what the search engines try to do is understand how the user thinks and what he/she wants from them, and according to it, give them the best information. On the other hand, from Yamin's (2013) punt of view, the most important moment for the searcher is during the query formulation, for that reason the results of the search engine should be accurate to it.

For example, a website about software programming has very different target users than a website about how to install a printer in the computer, and most probably the knowledge about Google search engine will be very different between ones and others. For that reason if the behaviour between them is different they can adapt their techniques according to it. Supposing that users with higher knowledge use links closer to the bottom of the page than users with low knowledge, the webmasters could use difficult key words to positioning the websites intended for the first group, because it is not that important if the link it is not in the first positions of the search. The explanation to this behaviour is that users with higher knowledge, has also higher experience on the search engine, and they can do a better analyse and selection of the website that they should visit. So, they know that in many times not because the website is in the first position of the results has better contents to his/her search.

1.9 Research Hypotheses

H1: Users with different Google search engine knowledge are different when using it.

H2: Users with low Google search engine knowledge visit more Pay Per Click links on Google search engine in percentage than users with high knowledge.

H3: Users with low Google search engine knowledge visit more websites in top positions on the Organic results of Google search engine than users with low knowledge.

1.10 Definition of Terms

- **Search Engine Optimization (SEO):** Technique which consist in manipulate the website with the goal of improve its ranking on the organic search engine results pages (Malaga, 2008).

- **Search Engine Marketing (SEM):** Technique which consist in lay a specific website like an advertisement on the search engine results for determinate searches according to its key words (Kumar & Kumar, 2014).

- **Search engine results page (SERP):** The list of websites that appear for a specific search on a search engine (Malaga, 2008).

- **Pay Per Click (PPC):** It is an advertising strategy based on the payment for each click on a specific link (Pfeiffer & Zinnbauer, 2010).

- **Organic Search results:** There are the results on the search engine results pege, which are not Advertisement, and for that reason appear there for free (Pfeiffer & Zinnbauer, 2010).

- **Keywords:** If we are talking about SEO or SEM, is a specific word or phrase that describes the contents of a website. If we want to appear in the search engine with a particular website for a determinate keyword, we should work on it, and for that reason focus mainly on the content and external links to the website (Scheitle, 2011).

- **World Wide Web (WWW):** The World Wide Web includes all the websites, other documents and media that we can find on the Internet (Scheitle, 2011).

CHAPTER 2
LITERATURE REVIEWS

2.1 Google

A recent study says that in U.S.A 58% of the families with children have more than 2 computers and 89% more than 2 smartphones (Ganong & Coleman, 2014). In the world today, the technology is growing very fast, and one of the bases of this evolution is the net of the websites working through Internet, because it interconnect everyone at the same moment. Nowadays, millions of websites, which contain billion of pages and documents, are available for all the people who is using the net. In 2010 more than 20 billion websites were indexed by the four major search engines in the planet: Google, Bing, Yahoo and Ask, so we are talking about a huge virtual world of websites (Shaikh, 2014; Yamin, 2013).

Google was founded in 1998, and in that moment also started its correspondent search engine. Nowadays is the most famous Internet service, and it has something very special: almost all the services that if offers are for free (Schuster, 2010). Iyer and Davenport (2008) did a study analysing Google like an innovation machine. For them, the key of success of Google is their capacity to support ideas from everywhere, but according to Yamin (2013), its popularity is due to another also important reasons like their constant improving method which makes them very fast in access, a good interface to the users, and a lot of possibilities in the moment to find information, as we can find websites, images, videos…

At the begging of the history of this monster, which is Google in the world today, the search engine was not the best one in the net. They start to be successful because of the fast service that they could offer to the users. All the other websites were working very slowly, and Google was different. This is one of the secrets of their success until now. Because even nowadays, when there are many websites and very important ones, the faster one is probably Google, and the easier to use even to test if we have Internet signal, or how fast is it working (Dean & André, 2013).

- Google search engine

Searching is one of the most popular activities on the Internet. Search engines have become an essential part of everyone's lives. To organize the websites in the search engine, it uses a methodology based on algorithms which compare the websites in the net and it classify them. Panda (2013) in his study says that to get a good performance, a search engine should operate well on these three phases: development, analysis and maintenance.

But in Google not everything is working very well. For example Google Scholar had not a very good start, and still has not very good searcher if we compare it with other databases (Boeker, Vach & Motschall, 2013). Google wants a natural positioning and the students prefer to locate information or resources via a search engine above all other options, and Google is the search engine of their choice (Griffiths & Brophy, 2005). And talking about students, there is a very interesting study by Wichadee (2014) where it is said that students are satisfied with learning through technology. And it is easy to understand. During these days, all the students have their own smartphone and laptop since they are very young, so they are use to them, and for that reason they prefer to work through technology than through books.

When we are talking about search engines, we can differentiate two different types of results: Organic and Paid. The Organic search results appear based on how the website fits to the algorithm of Google. On the other hand, non-organic search results include Pay Per Click (PPC) advertising. This kind of advertisement, appear in the Google searches results and the owner of the website has to pay for each click on his/her link according to the keywords that he/she has chosen (Pfeiffer & Zinnbauer, 2010).

For each kind of result, there is a specific tactic or technique, which the webmasters use to optimize the results on Google Search Engine Results Page (SERP). These techniques are SEO (Search Engine Optimization) and SEM (Search Engine Marketing). Most of the webmasters know something about SEO and the different tactics to help their website to be in the top of the organic search engine results. Another important tactic for Internet business is SEM, which includes payments and absolutely different strategies. Both techniques have more or less the same goal, but SEO and SEM are working in a different way.

- SEO (Search Engine Optimization) and SEM (Search Engine Marketing)

SEO are the strategies and tactics used by the webmasters to situate their websites in the top of the organic results. Rehman and Naeem (2013), define it like the activities of optimize websites with the goal to get higher ranking in the search engine. But when we are talking about higher ranking it can be some confusion. Higher ranking is not the same that higher position. It is the opposite. All the webmaster want a low position on the search engine and it will mean that the link is in the top of the page, and it means a high ranking.

If the website can be in the top positions of the search engine, will be easier that the visitors will see and click on their link. SEO is the combination of tricks and activities that the webmaster follow to get the websites in the top of the search engine. Some of these practices can be creating an specific content, using particular keywords that they are focus in and with the correct concentration, do keyword analysis, make a net of links which are going to the website, also called link building and in that way increase the link popularity, or even use social media links on sites such as Facebook and Twitter or improve the site's navigation to improve the user experience (Rehman & Naeem, 2013). But in another study (Malaga, 2008), he also speaks about black hat techniques or methods. Those techniques are negative for the SEO, and they decrease the position of the website in Google. Many times those techniques are the same techniques that I was referring before to achieve better positioning in the search engine, but using them abusively.

SEM techniques are very different from SEO techniques but with the same results, which is an increase of the visibility of the website on the search engine. The webmaster only pay for each click on his/her link which appear like an advertisement on the result of the search engine.

In conclusion, SEO aims to provide better organic search results, SEM uses the search engines to advertise the website to Internet customers and send the best traffic to the website. Also remark that SEO and SEM are not competing services, and if you want to conduct business on the Internet you need to be visible in both organic and advertised links, which means you need both SEO and SEM.

Usually, the webmasters start with investing in SEO, because of three main reasons. Firstly, because without do anything with their website, they appear in

Google, and just have to improve their position on Google searches. Secondly, because is easier to use than SEM. And thirdly, because it is a free service and they can make mistakes without very big economical consequences. But nowadays, companies' spending on search engine marketing is growing faster than spending on other online advertising (Dou, Lim & Su, 2010; Plaza, 2012).

- Google search engine users

Marcos & González-Caro (2010) define 4 kinds of searches or tasks: informational, navigational, transactional or multimedia tasks. Doing informational task, the user tries to get information, for example a telephone number or the biography of a singer. Secondly, in the navigational, they want to go to some specific website, for example to the website of his/her university, or from a specific company. On the other hand, in the transactional, the user wants to do some action, for example download some software, or hear some specific song, and finally using multimedia tasks they will be focus in try to watch some specific image and not in the other information of the website. For example if he want to watch some football player on an animal.

They concluded in their article that a half of the searches are informational, and the other half navigational and transactional, with only a few multimedia, but other authors like Langville and Meyer (2011) or Graepel, et al. (2010) say that search engines have other uses like spellcheck or like a search bar, which are common but occasional uses.

Enge et al. (2012) in their book say that in more than 60% of the searches are made between one and three words. 22,8% with one word, 22,8% of the searches with two words, 18,7% of the searches by 3 words, 13,2% by 4 words and 19,5% by more than five words, and on the other hand the most common users of search engines are men between 20 and 35 years old (data from 2011). They also concluded that between 10% and 15% of the clicks are going to paid links, and between 85% and 90%.

Tang and Hwee (2006) did and study to determinate how effective is Google with scientific searches. They studied how often the doctors have the correct diagnosis, with the result of 58% of success. It is a high rank of accomplishment, so it means that Google can be very useful in our lives.

- User knowledge about Google and position of the websites they visit

During this research we couldn't find information or studies where is related user knowledge about Google and the position of the websites they visit. But we found some studies about user knowledge where is considerate the most important factor in web search activity, and related with user satisfaction. The results of one of this the studies have proved that the user knowledge has an impact on search satisfaction. The relationship between user knowledge and search satisfaction can be described as how users utilized their knowledge to get best results that fulfil their information need (Yamin & Ramayah, 2011; Marcos & González-Caro, 2010).

On the other hand there are also studies like Enge et al. (2012) investigation where they have analysed just the position of the websites visited in the organic searches from random users, with the following conclusions: 42% on the link which is in the first position, 12% on the link which is second, 9% on third position, 6% on forth and 31% on the other positions. They also speak about the visibility of the links depending on their position. The links for the organic results which are between the first and third position have a 100% of visibility, 85% of visibility for the link which is in forth position, 60% for the fifth position, 50% for the links of websites which are on sixth and seventh position, 30% for which are in in the eighth and ninth and finally 20% of visibility for the links which are in the tenth position. Marcos & González-Caro (2010) tested 58 people from 18 to 55 years and 80 % between 20 and 30 years.

We also find information from Enge et al. (2012) about paid links, but only for their visibility and for the eight first positions: The first position just get a 50% of visibility, 40% of visibility for the second position, 30% for the third, 20 % for the fourth and 10% for the fifth, sixth, seventh and eighth.

Google search engine results have other aspects to consider. The position of the link is very important how we just saw, but there are other studies found where they say that there are also other important factors. In the study of Choi (2010), the participants were studied according to the objective that was suggested to them. The results were that their interaction with the websites was influenced with other aspects that can also attract the vision of the users like an image or a good related text, attract and help the users to achieve their goal. Every single detail can be very important at the moment to bring the attention of the searcher, for that reason is very important to

have a good formation about how exactly works Google and understand the last movements of the Google's algorithm and SEO and SEM tendencies.

2.2 Project and Study Design

We can find a study where they analyse the knowledge of the user about the search engine and compare their search satisfaction (Yamin & Ramayah, 2011). However, we also find research about which websites are visiting the users according to their position on Google search engine results, and comparing if they are paid or organic links (Enge et al., 2012). But there are no data about the relationship between the knowledge of the users about the search engine and the websites they visit, coming from organic or paid links and their position.

For that reason, we consider interesting to study this relation between user's background on Google search engine and their searches according to the position and kind of links they are using in the searches results. Our hypotheses are that there will be differences between the user knowledge of the search engine. First of all, inexpert users will tend to use more paid links than experts, and experts will use links situated on worst position, and it means closer to bottom of the results, because their experience will let them select the websites with better information analysing the information that the search engine show about the website.

Loringo et al. (2008) described in their article three studies using eye tracking to study online search, and the user behaviour on the website and on the other hand Yamin (2013) did an study where was evaluated the searchers activities and the interaction that they have with the search engine through a server log. These studies give them important information about the users behaviour using Google, and also Yahoo. But in the case of the eye-tracking software is a program that measures the eye positions and eye movement. In this case they just follow where the "mouse" is moving on Google and where they are clicking. This kind of software or technique is also called like Eyescan. Also Malaga (2008) or Enge et al. (2012) used this technique in their study. If we speak about the server log, the problem of this device is the price and previous knowledge to use it.

After analyse different methods that can work to do our research, say that our

study will be made in Spain because is the place from where we can get date from the interviewers. Specifically in Mallorca, which is an island situated in the Mediterranean Sea. The sample will be considerate representative of all Google users in Spanish language, and of all the users around the world. The search engine selected is Google because is the most popular search engine around the world and also in Spain (Segev, 2010).

2.3 Conclusion

This chapter 2 about literature review presents a summary about previous studies on related topic, which can give us the necessary information and background for the purpose of this research. The literature review focused on the use of Google search engine and its results, demonstrate that a relationship exists between the users' intention and their behaviour when they browse the results page. Knowing this behaviour is important for webmasters designers because they can improve their results on Google search engines.

On the other hand, we can find studies that are proving different behaviours depending on the experience and knowledge about Google search engine and the satisfaction of the search by the users. We can also find studies about percentages of visits of the websites on the results of Google search engines. However there is a gap of information in the knowledge that relates that knowledge and the websites they are visiting depending on their positions in the search engine.

For that reason we consider that is required an experimental testing dividing the users depending on their knowledge about Google with a theoretical strength evaluation, and analyse the relationship between the user knowledge about Google search engine and the position of the websites that they visit on it.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Population and Sample Size

The population of this research project will be Spanish people who are living in Mallorca because is the people on which we will have access during the thesis, and we can considerer them representative of the Google search engine users who are using Spanish in their searches around the world and in a lower relation of the all the Google search engine users in the planet.

The age of the interviewees will be over 14 years old, because we think that with this age, the interviewees will be adapted to the technology and they will be able to use search engines. On the other hand, we will not contemplate the gender of the study because according to Loringo et al. (2008) who did three different studies using eye tracking to study the online search, gender was considered but without influence in the behaviours.

We will use "sampling" as the technique used to do this primary research that enables to choose the amount of concerned and appropriated data for making an exploratory research (Dale, William & Ron, 2012).

The behaviour on Google search engine will be studied from people chosen by using a simple random choice, and we will divide them in 4 different groups in accordance on their knowledge and experience about Google search engine, therefore we will analyse 30 samples of each group, and it means that we will study 120 users. We will explain later the reason of this amount of sample. Also say that each user will do 4 different searches, and it means a total of 480 different searches analysed.

- Group 1: Unusual users – They know what is Google, but they don't use it so often.

- Group 2: Usual users – They use Google frequently for basic searches (informational searches).

- Group 3: Advanced users – They use Google daily for different purposes.

- Group 4: Experts users – They use Google daily for many purposes and they know how exactly Google search engine works.

The reason of this division in four different groups is to get interviewees regularly distributed in all the possible knowledge values. And in that way be able to get better results in our research.

The sample needs to be representative of the population that lead to the precise outcome. According to Sandelowski (2000), the samples for quantitative methodology like in our study, need to be representative of the population that lead to the precise outcome. In order to determine the sample size, the formula used is:

n=N/(1+Ne2), where:

n= Number of samples, N= Total population and e= Error tolerance

N= 407.648 (Population of Palma de Mallorca in 2012) (Instituto Nacional de Estadística, 2014)

e= 0,05 (Confidence level of 95 per cent, which will give us a margin error of 0.05)

n=407.648/[1+407.648(0,05) 2]=399,61

Therefore, the sample size in our study should be 400 people and it means 1600 Google searches analysed, but we consider that it too much for this kind of study, and our sample will be lower like we said before. Following other author, in this case, Agresti (2010), we can see in his study says that for small research projects which the methodology used is complex to analyse, a sample of 20-30 people for each group is enough to reach saturation in our results, and for that reason we decided to study 120 people, and it means 30 people for each group according to their knowledge about Google search engine. However we don't forget that using a "convenient" sample, there is a limitation in it, and we should consider it in our results.

3.2 Data Collecting Procedure

In order to collect the data to do the study, first of all we need to divide the interviewed people in four groups like we just describe before and study those 30 samples of from each group. For that reason, we will use structured survey questionnaires for face-to-face interviews, and in that way understand what relationship has the interviewee with Google search engine.

Before start the questionnaire we will ask to the interviewee his/her age and birth year, because we just want to interview people older than 16 years old, and

because this information can be useful in the future. The questionnaire will have 8 questions, and each question will have a specific goal (Appendix A).

The first question is just a selective question, because we don't want to analyse the people who have never use Google search engine.

1- Have you ever used Google search engine?

O Yes

O No

From the second to the last question (eighth), according to the answer that we will get we will give to the interviewee some points from 0 to 40, and according to how many points they get we will place them in each group:

- **Group 1:** Unusual users – 1-10 points
- **Group 2:** Usual users – 11-20 points
- **Group 3:** Advanced users – 21-30 points
- **Group 4:** Experts users – 31-40 points

The second question is about how often the interviewees are using Google search engine, and the aim of this question is to divide the users from first group and the others users. The users who will get 0 or 3 points in this question, if they are a beginners using Google search engine don't will get more than 7 points in the next questions.

2- How often de you use Google search engine?

O 0-4 times a month +0

O 1-7 times a week +3

O 1-5 times a day +5

O +5 times a day +10

The question number 3 has a maximum of 20 points with different uses of Google search engine. With this question our aim is to differentiate the users from group 2 and 3-4.

3- Do you usually use Google like/to…

O Academic/work purpose +2

O Translator +2

O Spellcheck +2

O Search bar + 2

O Find useful information +2

O Buy online +2

O Dictionary +2

O Find books/articles +2

O Find telephone numbers +2

O Find locations of places +2

The questions number four, five, six, seven and eight, have 10 points in total and have the goal to differentiate the users who really know how Google search engine is working. With these questions we will know which users are from group number 4.

4- Do you know how Google makes money? Explain it.

O No +0

O Yes +2

5- Do you know which links are advertisement in a Google search?

O No +0

O Yes +2

6- Do you know how Google organize the websites?

O No +0

O Yes +2

7- Do you know what is SEO (Search Engine Optimization)?

O No +0

O Yes +2

8- Do you know what is SEM (Search Engine Marketing)?

O No +0

O Yes +2

After we know the group and mark of the interviewee, we will proceed to get our real data from them. For that reason we will ask them to do 4 different searches using Google search engine with the aim to prove that the search behaviour is influenced by the user knowledge like Fadhilah and Ramayah (2011) have shown in their study about user satisfaction. In our case we will divide the results according to the group knowledge about Google search engine of each user. All the researches will

be made with the same computer, located in the Pharmacy Joana Fe Mas from Palma de Mallorca, and from where we will choose the interviewees.

The conditions of the research will be a limited time of two minutes for each search, and they may not use the name of any website, program or software. There are four main kinds of searches: informational, navigational, transactional or multimedia tasks. Doing informational searches, the user try to get information, with the navigational, they want to go to some specific website, with the transactional, the user wants to do some action and finally using multimedia searches they will be focus in try to watch some specific image or video (Marcos & González-Caro, 2010).

We will propose 2 informational searches because 50% of the searches are like this (Marcos & González-Caro, 2010) and 1 navigational and 1 transactional search because 20% of the searches are in this purpose.

Only a minority of the searches are multimedia, or with other aims like use Google search engine like spellcheck or a search bar, and for that reason we will misprize this kind of searches.

The Google's searches that we are going to propose will be:

1- How high (m) is the 18th tallest skyscraper in the world? (Informational search)

We formulate this first question because it is an informational search which no one knows and requires a lot of research through Google search engine because it needs actual data to answer it correctly.

2- How many men tennis players from Spain are between the first 100 players in the world? (Informational search)

Like the first question, in Spain, even the tennis fans don't know how many Spanish players are in the top 100, because is something that changes every month, because the players are getting points from each tournament that they are player are their ranking is going up and down. So, that informational search also needs a deep research.

3- Watch an specific football match (live) (Navigational search)

This is one of the most common action or searches in Google search engine in Spain. It is a navigational search because the user will be trying to find a website where he/she can watch the match online.

4- Book without prepayment an hotel in New York for tomorrow at the 8th Avenue for 3 people and less than 100 Dollar (Transactional search)

For this transactional search, the user needs to book a hotel in New York for the next day. The search is very complicated, because has different conditions. First of all the hotel need to be in one of the most important streets in Manhattan, for three people and for less than 100 Dollars, which is almost impossible, but in this way, we can see how he/she use the Google search engine with this purpose. This question is also very useful for us because its easy to get PPC links on the results of the searches about booking hotels, and it will help us to study the percentage of incidence on this kind of links by the users.

For each search, the user has a maximum of 2 min, because we don't want a longer interview than 15 minutes.

For each search, we are going to write in the Google search database (Appendix B) all the links that the users will visit. Differentiating them if there are PPC or Organic links and their position. According to the Figure 3.1, PPC links can be on the Top (T), Right (R) or Bottom (B) but we just will write if the link is PPC or not. On the other hand, organic links can be in position 1-10 in the first page, 11-20 on the second page like we can see in the Figure 3.1… An example of the data from one search can be:

PPC, 4,5/1,11, PPC, 3, 4/ 1

It means that the user did 3 different searches, which are separated by "/", and visit a total of 9 websites, 2 of them with PPC link, and 7 of them with Organic links with positions 4,5,1,11,3,4 and 1, which means that the average of the links of the Organic searches is 4,14 (4+5+1+11+3+4+1/7=4,14).

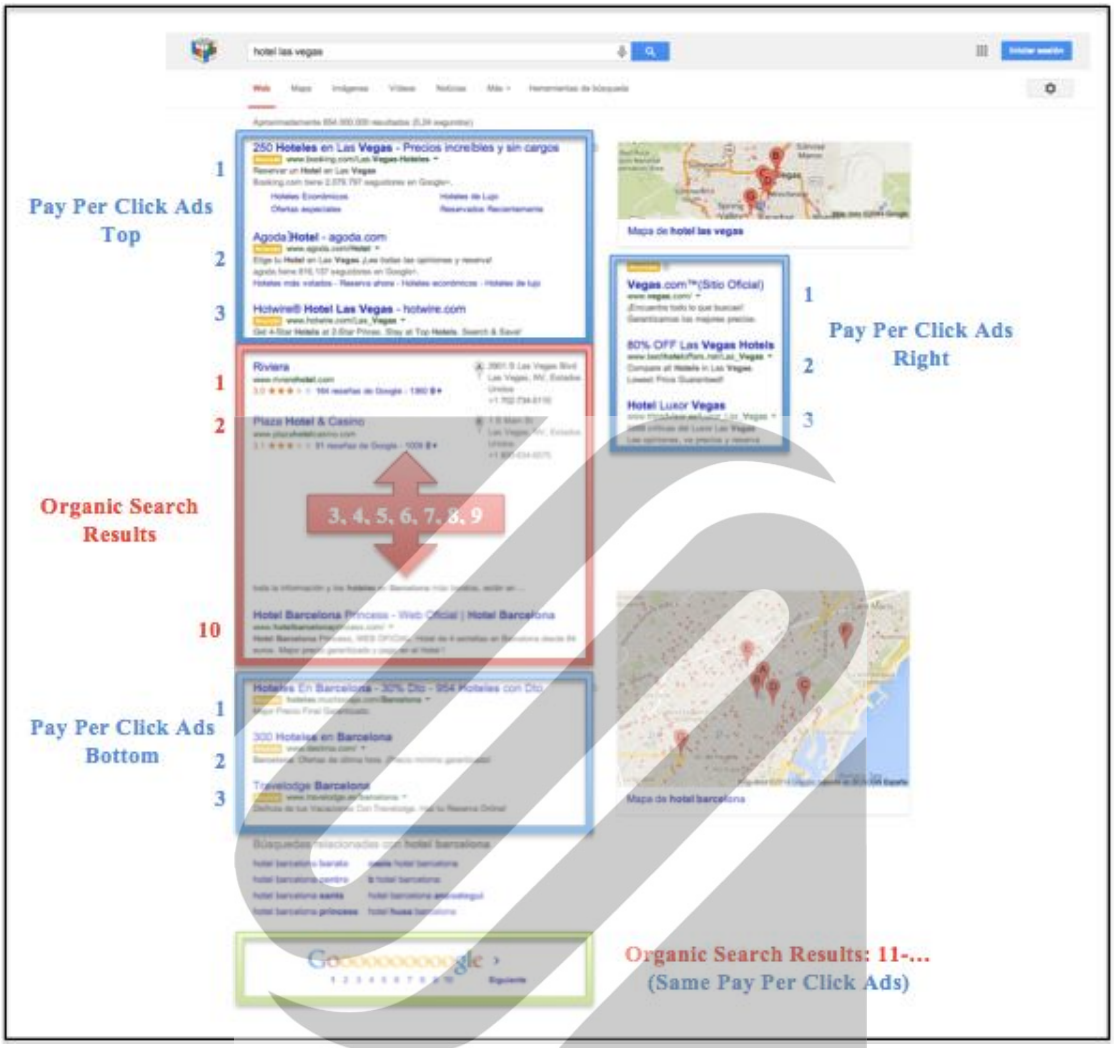

Figure 3.1 Links positions

3.3 Quantitative Data Analysis

We will do quantitative data analysis because the data that we will get will be numeric in form and we will use statistical techniques to draw conclusions about participant behaviour.

The analysis will be made using correlation analysis with a Data Analysis Program in order to test the relationship between the percentage of PPC and Organic links visited and each group of Google search engine knowledge, and the average position of the websites visited on Organic searches from each group. The analysis of the data collected will be studied through Pearson Correlation and Linear Regression

to determine how hard is the relation between variables. The results will be presented in tables and graphics.

CHAPTER 4
RESEARCH FINDINGS

4.1 Result Data Analysis

The main goal of the research is to identify the relation between the knowledge about Google and familiarity with the search engine by the users and the position of the websites that they visit during the searches. We divide the position of the websites in Google in two big groups, Pay Per Click (PPC) and Organic results, and we will analyse them separately (Hypothesis 2 and 3). The Hypothesis 1 is general and includes the other two.

We will use Pearson Correlation to analyse the relation between two variables, because we suppose a linear relation between them in both cases (H2 and H3). For this research, we will use the method of Pearson Correlation Coefficient to measure the relationship between the independent variable and the dependent one. In both cases, the independent variable is the knowledge about the Google search engine evaluated by an specific mark between 0 and 40 for each user, and the dependent variables are the Google website position visited, which we are going to divide in two groups. On one hand, the percentage of Pay per Click links visited (H2) and on the other hand the average of Organic links (H3).

Pearson Correlation Coefficient is very useful for relationship analysis. With this technique, we can prove the relation and connection between two variables and it will give us the information about how strong are they associated. The correlation coefficient results are between -1 and 1, which represent as very high positive to very high negative relationship. If the result of the Pearson Correlation is 0 (r=0), it means that there is no relation between variables.

After studied the behaviour of 120 people, where 30 of them were from each group according to their knowledge, the data obtained from the analysis by Pearson Correlation and Linear Regression of the 4 different searches using Google search engine for each interviewee has been recollected and presented in the following graphics and tables for each Hypothesis.

Test Hypothesis 2

H2: Users with low Google search engine knowledge visit more Pay Per Click links on Google search engine in percentage than users with high knowledge.

For the second Hypothesis we have two variables. On one hand we have the test mark, obtained from the questionnaire, and the values of the marks are between 0 and 40, witch is the higher punctuation. On the other hand, we have the percentage of Pay Per Click links visited on Google search engine. Theoretically, we have divided the two variables of this Hypothesis in dependent and independent. In this case, our independent variable is the test punctuation, like we can see in the conceptual framework of the study, and our dependent variable is the percentage of PPC links visited.

To test this second hypothesis, the first step that we did was to study the Pearson Correlation between variables. For that reason firstly we studied its graphic relation. Like we can see in the following graphic (Figure 4.1), we locate the dependent variable, which is the percentage of PPC links visited on Y Axis, and the independent variable, which is the test punctuation on X Axis.

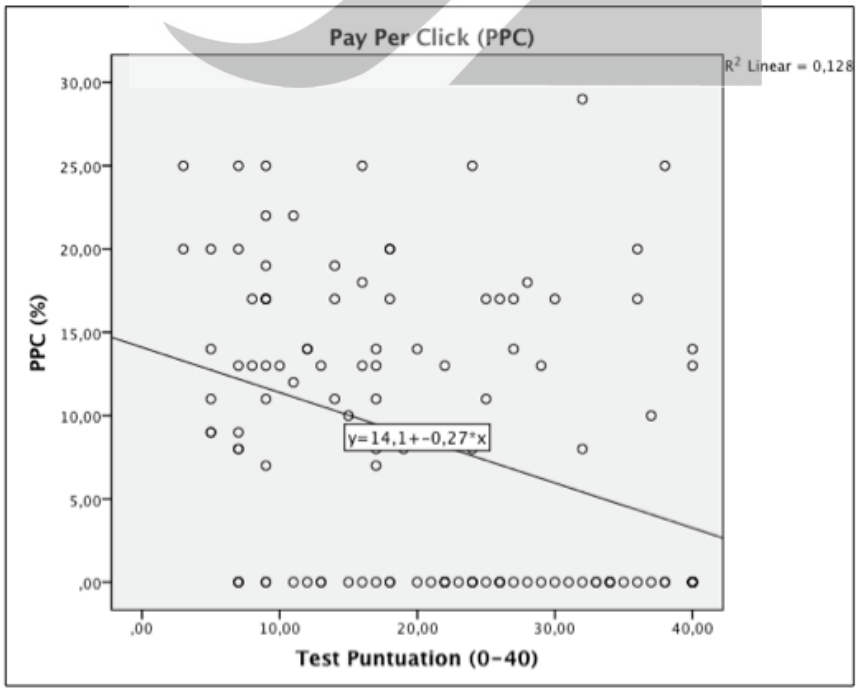

Figure 4.1 Pay Per Click

In the graphic we can see how the inclination is negative, and it means that there is a negative correlation, therefore, our prediction is fulfilled, because how higher is the knowledge about Google, lower is percentage of Pay Per Click Links visited. We can also observe how the points are very disperse, but it is because a big percentage of users didn't click any time on the PPC links, and it means that his percentage of PPC links visited is 0%.

After the graphic relation, we had studied the numeric relation through Pearson bivariate correlation. The results of the correlation are the following:

Table 4.1 Hypothesis 2 Correlation Coefficient

		Test Punctuation (0-40)	**PPC (%)**
Test Punctuation (0-40)	Pearson Correlation	1	-,358**
	Sig. (2-tailed)		,000
	Sum of squares and Cross-products	15281,967	-4145,800
	Covariance	128,420	-34,839
	N	120	120
PPC (%)	Pearson Correlation	-,358**	1
	Sig. (2-tailed)	,000	
	Sum of squares and Cross-products	-4145,800	8776,800
	Covariance	-34,839	73,755
	N	120	120

**. Correlation is significant at the 0,01 level (2-tailed).

Like I said before, after study the results of the graphic relation, in the Table 4.1, we can see how the correlation is negative and r=-0,358. This value means that the relation between variables is weak-medium, because we consider weak relation with the total value of 0,25 and medium of 0,5. Anyway, the relation exists and it is

significant between Pay Per Click percentage of visits and the test punctuation about Google Knowledge.

Based on Pearson Correlation at 95% confidence interval, the result of the test indicates that significant value of 0,00, which is less than 0,05. It means then, that the null hypothesis should be rejected. The figure interprets that there is significant relationship between the result in the test and the percentage of PPC links visited.

To know how influenced is the percentage of PPC links visited and the knowledge about Google, what we did is linear regression between variables. In this case we also use the test punctuation like independent variable and percentage of PPC websites visited like dependent variable.

Table 4.2 Hypothesis 2 Descriptive Statistics

	Mean	**Std. Deviation**	**N**
Test Punctuation (0-40)	21,0167	11,33225	120
PPC (%)	8,4000	8,58805	120

a. Predictors: (Constant), Test Punctuation (0-40)

The Table 4.2 show us that the average of the punctuation that the interviewees got in the test is 21, and the average of the percentage of PPC links visited is 8,4%.

On the other hand, as we can see on the Table 4.3 obtained from the linear regression, the value of R is 0,358 and it means that if we multiply this result for 100, we will get the percentage of PPC websites visited that are influenced by the punctuation of the Test that we did in the interview, in this case is 36% then. It is not a very hard relation, but enough to say that exist a linkage.

Table 4.3 Hypothesis 2 Model Summary

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	,358[a]	,128	,121	8,05284

a. Predictors: (Constant), Test Punctuation (0-40)

Finally, say that from the Table 4.4, we can get the different coefficients of the line we got, and the equation is the following: Y=14,102 – 0,271X. It means that we

can estimate with a 36% of success the average of PPC webs visited in our searches according to the results of the interviewee in our Test. For example a user who got 35, should use 4,6% of PPC links (Y=14,102 – 0,271 . 35= 4,6), when a user who got just 12 in our Test, should use 10,9% of PPC links (Y=14,102 – 0,271 . 12= 10,9)

Table 4.4 Hypothesis 2 Coefficients

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	14,102	1,554	,128	9,075	,000
Test Punctuation (0-40)		-,271	,065	-,358	-4,165	,000

a. Dependent Variable: PPC (%)

Test Hypothesis 3

H3: Users with low Google search engine knowledge visit more websites in top positions on the Organic results of Google search engine than users with low knowledge.

For this third Hypothesis, we also have two different variables, on one hand the independent one which is the same that in the test for the Hypothesis 2: the test punctuation about Goggle search engine knowledge, and the dependent one is the average of the organic links visited during the four searches analysed.

Firstly, to study this Hypothesis 3, we did the Pearson Correlation between both variables. The dependent one is going to the Y Axis, and the independent to the X Axis, like we can see in the following graphic.

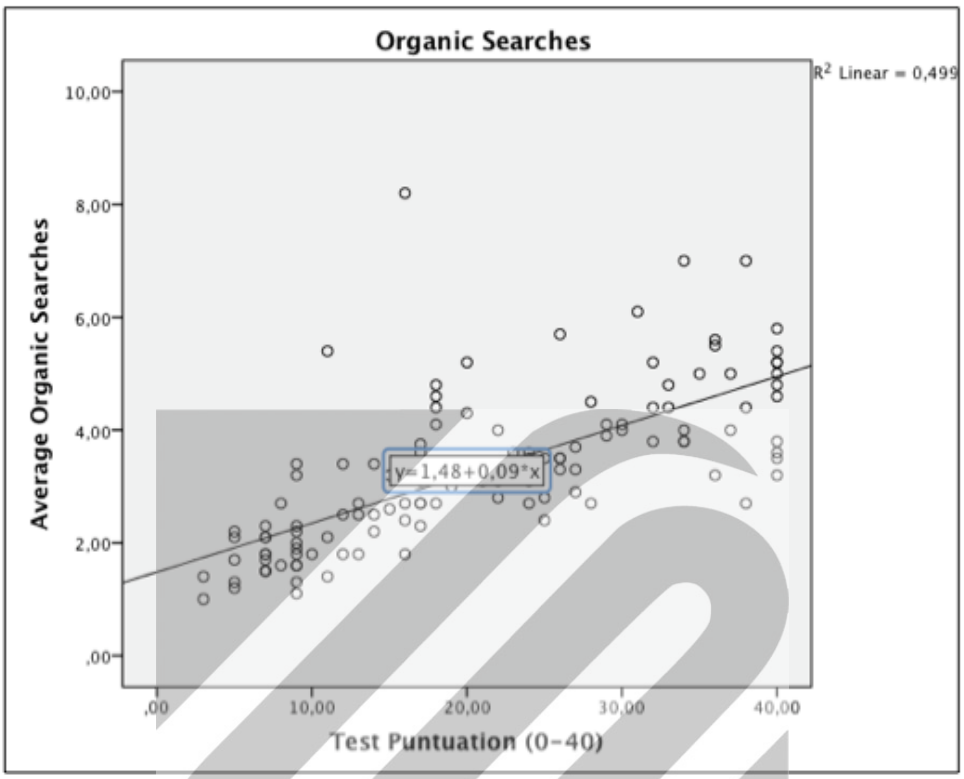

Figure 4.2 Organic Searches

For the third Hypothesis we have a positive correlation like we had predicted. It means that experimented users use lower links on the Google search engine, and for that reason the average of the position of the websites visited is lower than non experimented users with less knowledge about the search engine.

Secondly, we got the following results with Pearson Correlation.

Table 4.5 Hypothesis 3 Correlation Coefficient

		Test Punctuation (0-40)	**PPC (%)**
Average Organic Searches	Pearson Correlation	1	-,706**
	Sig. (2-tailed)		,000
	Sum of squares and Cross-products	230,210	1324,891
	Covariance	1,935	11,134
	N	120	120
Test Punctuation (0-40)	Pearson Correlation	,706**	1
	Sig. (2-tailed)	,000	
	Sum of squares and Cross-products	1324,891	15281,967
	Covariance	11,134	128,420
	N	120	120

**. Correlation is significant at the 0,01 level (2-tailed).

Based on Pearson Correlation at 95% confidence interval, the result of the test indicates a significant value of 0,000, which is less than 0,05 and it means that the null hypothesis should be rejected. The figure interprets that there is significant relationship between the result in the test and the average of Organic links visited.

On the other hand, based on Pearson Correlation Coefficient, the relation between variable is strong and positive, because is: 0,706. We consider the relation medium-high, because from 0 to 1, we can say that 0,5 is medium and 0,75 high.

Secondly, using linear regression with the same variables, we will be able to know how influenced are both variables, we can see on the following results reflexed on the Table 4.6, how the average of the tests from the 120 interviewees, was 21/40 and the average of the organic searches was 3,3.

Table 4.6 Hypothesis 3 Descriptive Statistics

	Mean	**Std. Deviation**	**N**
Average Organic Searches	3,3046	1,139088	120
Test Puntuation (0-40)	21,0167	11,33225	120

The Table 4.7, show us that the value of R is 0,499 and it means an influence of a 50%, on the average of the Organic links visited and the punctuation on the test about Google knowledge, which is a high result.

Table 4.7 Hypothesis 3 Model Summary

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	,706[a]	,499	,495	,98869

a. Predictors: (Constant), Test Punctuation (0-40)

Finally, we can find on the Table 4.8 the coefficients of the equation of the linear regression, and we can predict the average of the positions of the websites visited according the knowledge of the users.

Table 4.8 Hypothesis 3 Coefficients

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	1,483	,191		7,771	,000
Test Punctuation (0-40)		,087	,008	-,706	10,840	,000

a. Dependent Variable: Average Organic Searches

A user without any knowledge and experience about Google search engine (test mark=0), tends to click between the first or second link on the Organic results: Y=1,483+0,087 . 1= **1,57**, when a user with a lot of knowledge (test mark=40) tends to visit links around the fifth position Y=1,483+0,087 . 40= **4,96**.

Test Hypothesis 1

H1: Users with different Google search engine knowledge are different when using it.

This Hypothesis is like a summary of the second and third Hypothesis. The results we got from the Hypothesis 2 is that the correlation is significant (0,00 lower than 0,05) and the relation between variables is weak-medium (r=-0,358). On the other hand, from the Hypothesis 3, we got the results that the correlation is also significant (0,00 lower than 0,05) and the relation between variables is medium-high (r=0,706).

So, we can conclude that the users with different Google search engine knowledge act differently when they are using it.

4.2 Discussion of findings

The main objective of this study is to identify the differences using Google search engine from the users according to their knowledge and experience on it. The reason to do this kind of study is because it can help the webmasters with their strategies to optimize the position of the websites in the Google search engine.

According to our Hypothesis, if we can prove that users with low knowledge and experience on Google don't tend to use links in bottom positions of the first page of the search results, for example the 6^{th}, 7^{th},… position or even other pages, it has no sense trying to situate a website in those position for a determinate kind of search if we try to attract users with low experience, for example a website for beginners using a laptop, or popular programs or applications. On the other hand, if users with high experience and knowledge about the search engine, don't use with a lot of incidence PPC links, it is not a good option to spend money on it trying to give visibility to our website if our target market are people with a lot of knowledge, for example if our website is about SEO or SEM.

In our study, we had focused on the position of the links visited from the users, dividing them in two groups: The Pay Per Click links or PPC, and the Organic links as we can see in the Figure 3.1. The division is because apparently there are not difference between one kind of links and the other, but for the webmaster they have

almost any relation, and they work very different, and users with high knowledge know it and they should act in consequence.

Pearson Correlation Coefficient was applicable as statistical treatment of data, and after analysing our findings we can see how we can prove the difference between users according to their knowledge about the search engine. Even we have 3 different Hypothesis, the first one is just to prove that difference between users, and the second and third Hypothesis are studying two different cases of that difference of behaviour depending on the kind and location of the links on the Google search engine. In both cases, the correlation is significant because is 0,00 and it is lower than 0,05, and it means that it is under 95% confident level, and for that reason the relationship result for each dimension is demonstrated.

Also say that the relation between variables is weak-medium and negative for the H2 (r=-0,358), and it means that how higher is the knowledge, lower is the percentage of PPC links visited but with a not very strong relation. On the other hand, for the H3 the relation between variables is medium-high and positive (r=0,706), and it means that how higher is the knowledge and experience on Google search engine also higher is the average of the websites visited which are organic. Remember that that how higher is average of websites visited, closer to the bottom are those websites.

The Hypothesis 2 and 3 can be affirmed, for that reason we can prove the Hypothesis 1, and in that way say that users with different Google search engine knowledge are different when using it.

CHAPTER 5
SUMMARY, CONCLUSION & RECOMMENDATION

5.1 Summaries

The purpose of this study was to determine the relation between the knowledge of the Google users about its search engine and their behaviour on it. And the reason to study it was because it can be very useful for the webmasters who are working with SEO (Search Engine Optimization) and SEM (Search engine Marketing) techniques with their websites. Both techniques are useful to increase the visibility of the website in the Google Search Engine mainly, because is the most important Search Engine in the world and far away of the second best search engine in many countries.

Every website has its target market. A website intended in how to use the PowerPoint or how to download a music player, has very different target market than a website about Java code or SEO. These target markets differ in their experience and knowledge with the computers and probably in how the search engine works. Nowadays, when the user is using frequently a computer or laptop, he/she spend most of the time in internet, and when we are talking about internet, we talk about Google, because like I said before is the most important website in the net and the more used.

When we had analysed their behaviour of the users using Google search engine, we could study many aspects like the average of words that they write for the searches, how much time they need to find the website they are looking for, the percentage of success in their searches… and we are pretty sure that it is also high related with the experience and knowledge about the search engine. However, we decided to study the position of the links visited by them, because a lot of reasons. First of all, because is easier to study than other variables. Another reason is that it can be very useful for the webmasters, if they know the behaviour of their target market and for example if its better to stay in the top positions or not. The same happen with de PPC links. Our Hypothesis was that there is difference using this links according to the knowledge. The people who doesn't know how are working this kind of links tend to use them, because they are highlighted in an other colour and in the top positions,

but the users with experience and knowledge know that the webmasters of those websites have to pay for each click on the link, and because of this, the website try to attract people to earn easy money and it usually tends decrease the quality of the information, the presence of some tricks to earn money, or they just offer applications or information in exchange for money.

For that reason, we have divided the links of Google in two big groups: PPC links and Organics links as we can see in the Figure 3.1. And in the way to study both kinds of links, we have divided our study in two main Hypotheses. On one hand, the H2 was about PPC links, and to prove the difference of incidence according to the knowledge of the users, and the H3 just about the Organic links to also prove also the difference of incidence from the users with more or less experience and background.

To be able to do this study, first of all we had to divide the users and give them a specific mark about the independent variable of the study, which is the Google knowledge. We did it through a questionnaire, where they could get a mark between 0 and 40. In the way to get users with all kind of punctuations and in that way be able to do a good study, we have divided the users in 4 groups: The first one comprising for unusual users. They know what is Google, but they don't use it so often. The second group comprising usual users. Those users use Google frequently for basic searches. The third group was about advanced users, who use Google daily for different purposes. And finally the forth group comprising experts users who use Google daily for many purposes and they know how exactly Google search engine works.

We have chosen 30 users for each group because according to Agresti (2010) for small research projects which the methodology used is complex to analyse like in this case, a sample of 20-30 people for each group is enough to reach saturation in our results. For that reason we had 30 users with a mark between 0-10, 30 between 11-20, 30 more between 21-30 and finally 30 users between 31-40.

Once we have measured our independent variable, we did the same for our other two dependents variables, analysing which links were using our sample during the four different searches, and getting the percentage of PPC websites visited for our Hypothesis 2 and the average of Organic links visited for the Hypothesis 3. Once we got both dependent variables measured, what we did is to study the relation between both of them and the independent variable separately. In the way to do it, we used the

SPSS program, and compared variables using Pearson Correlation and Linear Regression, getting the following results. In both cases, the correlation is significant under 95% confident level, and for that reason, the relationship result for each dimension is demonstrated. On the other hand, the relation between variables is weak-medium and negative for the H2 (r=-0,358), and medium-high and positive for the H3 (r=0,706).

We can conclude then that H2 and H3 have been fulfilled and therefore we can aldo say that H1 is also fulfilled.

5.2. Discussions

This study has two main hypotheses, which are H2 and H3. Both of them are analysing the behaviour of the Google users on its search engine according to the position of the links visited. The H1, just try to prove that there is a difference between users according to their knowledge, so if H2 or H3 are true, H1 will also be true. However, H1: Users with different Google search engine knowledge are different when using it, H2: Users with high Google search engine knowledge use more percentage of organic searches on Google search engine than users with low knowledge and H3: Users with high Google search engine knowledge visit websites with lower position on Google search engine than users with low knowledge.

For that reason H2 and H3 are not enough to disprove H1, because there are other aspects where users can act differently using the search engine. If the result would be negative for H2 and H3 we couldn't say that H1 is not true, but in our case both results are positive, and we can also prove H1. Users with different knowledge visit in higher or lower proportion the links showed by Google according to their position in the page.

Say that users act in a different way is not very difficult and complex. It is obvious that with different experience and knowledge about some application, program, website,… they will act different, because they know better its performance. In our case, it is easy to know that there are differences using the search engine, but it is difficult to prove it, and the most important, take advantage from this differences and improve the SEO and SEM techniques.

Now, referring to the H2 and speaking about Pay Per click links, say that the result of the correlation is significant and the relation between variables is just weak or medium. But if we divide the results of the four different groups, we can see clear differences between them, even if the relation between variables is weak. 25/30 users from group 1 were using PPC links, 22/30 from group 2 were using them, and only 15/30 from group 3 and 7/30 for group 4. In our opinion, from the four different searches that we have proposed to the users, just the last one, which is the transactional search: "Book without prepayment an hotel in New York for tomorrow at the 8th Avenue for 3 people and less than 100 Dollar", is the unique proposition to tend to do searches where there are a lot of PPC links, and it is not enough to analyse the incidence to click on them. Just 59 from 120 people interviewed visited some website with PPC, and for that reason is very difficult to get meaningful conclusions. One solution could be to increase the number of searches with higher percentage of PPC or do a specific study about this kind of links.

The differences between users have sense. The users who don't know how PPC links are working, and why they are at the top of the websites and in an square with different colour, tend to click on them, but who know that the webmasters of those websites have to pay for each click on its links, already know that it has a high cost and they need to get an average of money for each click higher than the money that they pay to Google for each click, so usually the services that they offer in those websites are exchange for money transferences, so many expert and usual users try to skip them, depending on the kind of searches that they are doing. For example if they only need information or some applications that should be free, they will not use PPC links, but if they want to buy something they could use them, even there is not very common.

Finally, speaking about the H3 about Organic searches, the result of the correlation is also significant and in this case, the relation between variables is high with r=0,706. There was a big difference in the average of the position of the links visited by the users. Using the correlation equation, and using the values of the lowest punctuation in the test in the higher, we can predict how a user with a mark of 1/40 should have an average of 1,57, when a user with 40/40 an average of 4,96. This difference is very high, because it is almost 4 positions on the Google page.

The explication about the difference of the average of the websites visited, is that a user with experience and high knowledge, knows how to select better a website according to the information visible in the preview of the website in Google. On the other hand he/she also knows that in the top positions can also be websites with a good SEO techniques, and it doesn't mean that they have better quality of contents. Everyday Google is getting better, and through their algorithm they try to get the best websites in the top, with the most reliable information and quality, but the webmasters have some tricks to get this first positions, and some users know it, and they can even identify and skip them.

After spoke about the different Hypothesis, now we should do incidence on the objectives. The first objective, which is to analyse the relationship between the users knowledge about Google search engine and the position of the websites that they visit on it, have been solved. We have analysed the relation between their knowledge and the average of the links visited that were Organic results, and on the other hand the percentage of Pay per Click links visited during the four searches that we have proposed to them. The results of our analysis is that there is a high relation between the knowledge about Google from the users and the average o websites visited which are in the Organic results. For that reason the people with less knowledge tend to use the links which are in the top positions of the website, so the average of the websites visited by them is lower (the links with low positions are in the top of the page: position 1, position 2…), and on the other hand the users with higher knowledge, tends to click on links situated below them, so the average of the position of the websites visited by them will be higher. We can see this positions on the Google results in the Figure 3.1.

On the other hand we also have studied the percentage of Pay Per Click links visited according to their knowledge about the search engine, and could also conclude that there are also related, but in this case the relation is not that strong that for the organic results. Now the relation between variables is weak-medium, but it still exists. Users with high knowledge about the search engine tend to visit less PPC links than users with low knowledge.

The second objective is to learn how the user access to Pay Per Click links according to their knowledge about them. Therefore this objective is already included

in the first objective and is also solved. Like I just said before, this relation is not very strong, but the linkage exists. People with less experience and Goggle search engine knowledge visit in higher proportion this kind of links, because they think that are normal links, or even the most important links in the search results of Google, when users with more knowledge and experience, usually try to skip it.

Finally, the third one is to find a new theory that relates the user knowledge and their behaviour on Google search engine. This objective is also solved, because with the results we got, we can say the following theory: Users with low knowledge on Google search engine use in higher proportion Pay Per Click links, and links situated in the top of the websites than users with higher knowledge.

5.3 Conclusion

Nowadays Google is one of the most important companies in the world, and its search engine has penetrated in our society. Almost all the companies and Business have a website, and their webmasters use different techniques called Search Engine Optimization (SEO) and Search Engine Marketing (SEM) in order to attract visitors through Google search engine.

A better understand of the behaviour of the users of the search engine will help the webmasters to improve their techniques, and for this reason this research used a quantitative study to explore it and in order to solve the objectives of the study.

Once we have done this study, we can conclude that exist a relation between the knowledge about Google search engine and the links of the websites visited by the users according to their position on the result page of the search engine.

On one hand, exist a weak-medium negative relation (Pearson's r= -0,358) between the knowledge about the search engine and the percentage of Pay per Click websites visited by the users. It means that how higher is the knowledge about the search engine, lower is the incidence from them on PPC links.

On the other hand, the relation between their knowledge and average of the position of the links visited from the organic results is medium-high (Pearson's r= 0,706) and positive. It means that users with good knowledge about the search engine,

the users tend to click on links with higher positions on the Organic results, and it means that those links are closer to the bottom of the page.

For that reason, we consider that the experimented users, and therefore with better knowledge, can identify the websites with better information and benefits according to their searches, and usually exclude PPC links and websites in top positions of the organic results.

However, like I will explain below there are several limitations in this study, and we should do more and better studies in order to confirm the hypothesis of this research.

5.4 Limitations of the Study

We can find many limitations to this study. Almost all of them are about the methodology used. First of all, speaking about the sample of the study, it needs to be representative of the population, and according to Sandelowski (2000) using the formula n=N/(1+Ne2), where: n= Number of samples, N= Total population and e= Error tolerance

N= 407.648 (Population of Palma de Mallorca in 2012 from Instituto Nacional de Estadística, 2014)

e= 0,05 (Confidence level of 95 per cent, which will give us a margin error of 0.05)

n=407.648/[1+407.648(0,05) 2]=399,61

Therefore, the sample size should be 400, however it was too much for our kind of study and according to the study of Agresti (2010), we have divided our sample in 4 different groups according to the knowledge about Google search engine and in order of what the authors says in his study, between 20 and 30 people for each group is enough to reach saturation in our results, and for that reason we decided to study 120 people, and it means 30 people for each group according to their knowledge about Google search engine. However it is an important limitation in our research.

The sample is only from the Spanish city of Palma de Mallorca because is the place where we will have access during this research, and we can considerer them representative of the Google search engine users around the world. However, in order

to get better results the test should be done in different places in the world and in different languages.

On the other hand, we find another limitation in this study in one of the bases of the study, which is the questionnaire that we did in order to give a value between 0-40 to each user about their knowledge on the search engine, and in that way get the independent variable of the study. And I say that it is a limitation because the interview was invented completely and without any previous test to confirm that it works. However, it was made very accurately, dividing the test in four different phases according to the 4 groups of users according to their knowledge, and once made the study and the feedback with the interviewees, we can see how the test results were optimum.

Finally, another limitation of the research is the different searches that we propose to study the percentage of PPC visited by the users. The questions that we ask to the users to do their research through the search engine were: How high (m) is the 18th tallest skyscraper in the world? (Informational search), How many men tennis players from Spain are between the first 100 players in the world? (Informational search), Watch an specific football match (live) (Navigational search) and Book without prepayment an hotel in New York for tomorrow at the 8th Avenue for 3 people and less than 100 Dollar (Transactional search). We have proposed 2 informational searches because 50% of the searches are like this, and 1 navigational and 1 transactional search because 20% of the searches are in this purpose according to Marcos & González-Caro (2010). But from those 4 different propositions, just the last one about booking a hotel tend to give several PPC links in their searches, and it is not enough to analyse the Hypothesis 2 in our case.

5.5 Recommendations of the Study

The recommendations for further researches are linked to the limitations previously announced in order to skip them. Firstly, I recommend larger sample size in order to interpret the data more accurately and avoid the limitation of the sample size of this study.

Secondly, I also recommend to get the data from different places, and not only from the same place in this kind of studies where we are doing a global study and not local.

Thirdly, it also can be very interesting study the behaviour of the users according to their age. Young people have been living all their life with a laptop or smartphone close to them, and the most important, with Google in their everyday life, for that reason their behaviour will be more intuitive, and better to apply to SEO and SEM techniques and adapt for the future.

On the other hand, if we use some questionnaire, it should be tested or even better used in other studies by other authors. In our case it was just invented, and it is not the case, but we could have problems using it.

Finally, say that it should be better to do different studies for PPC links and Organic links, and after that, if is necessary do a new study just analysing the relationship between them. And if our goal is to study this relation between Organic links and Pay Per Click links, we should get data from different searches where the tendency is to find PPC links, and in that way be able to do a better analysis.

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APPENDIX A

GOOGLE KNOWLEDGE QUESTIONNAIRE

APPENDIX A

GOOGLE KNOWLEDGE QUESTIONNAIRE

Sample X

User Behaviour on Google Search Engine
Stamford International University
Academic year: 2013/14

- Gender:
- Birth year:

1- Have you ever used Google search engine?
O Yes O No

2- How often de you use Google search engine?
O 0-4 times a month +0 O 1-7 times a week +3
O 1-5 times a day +5 O +5 times a day +10

3- Do you usually use Google like/to…
O Academic/work purpose +2 O Translator +2
O Spellcheck +2 O Search bar +2
O Find useful information +2 O Buy online +2
O Dictionary +2 O Find books/articles +2
O Find telephone numbers +2 O Find locations of places +2

4- Do you know how Google makes money? Explain it.
O No +0 O Yes +2

5- Do you know which links are advertisement in a Google search?
O No +0 O Yes +2

6- Do you know how Google organize the websites?
O No +0 O Yes +2

7- Do you know what is SEO (Search Engine Optimization)?
O No +0 O Yes +2

8- Do you know what is SEM (Search Engine Marketing)?
O No +0
O Yes +2

TOTAL SCORE:
GROUP:

APPENDIX B
GOOGLE SEARCHES DATABASE

APPENDIX B

GOOGLE SEARCHES DATABASE

Sample X

User Behaviour on Google Search Engine
Stamford International University
Academic year: 2013/14

1- How high (m) is the 18th tallest skyscraper in the world?
- Position of the websites that he/she has visited:

2- How many men tennis player from Spain are between the first 100 players in the world?
- Position of the websites that he/she has visited:

3- Watch an specific football match (live)
- Position of the websites that he/she has visited:

4- Book without prepayment an hotel in New York for tomorrow at the 8th Avenue for 3 people and less than 100 Dollar
- Position of the websites that he/she has visited:

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