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The research as described in this document was done by the first author as noted below. He was a BTech student at the Cape Peninsula University of Technology (CPUT) in 2014 - the topic was given as a student project at Honours level. This working paper has not been peer reviewed, but has been edited for basic grammar and accuracy. References have been standardized as far as possible according to the Harvard system. Consider this document as a working paper, to be used for basic referencing but not as seminal source for research work. It could be useful for research in the fields of Website Visibility, Information Retrieval, Website Usability, Interface Design and Search Engines.

A comparison of the effect of single-word versus hyphenated domain name choices on website visibility

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Abstract

Domain name choices play an important role in website visibility. This research investigates the effect of the choice between single-word and hyphenated domain names on website visibility. Secondly, the users' opinions when they have to choose between the two are recorded and evaluated. Results indicate that users prefer non-hyphenated domain names as they were easier to remember. At the same time, they were afraid of the risk associated with spamdexing in hyphenated domain names.

Keywords

website visibility, domain names, hyphenated

1. Introduction

A domain name is the address where a website is hosted, and is normally expressed in a way that a human can easily remember and type in on a computer: www.google.com, for example. Domain names consist of a root name followed by a full stop (pronounced "dot") which is then followed by a top level domain indicator (e.g., ".com", ".org", ".gov", ".net", etc).

It is a known fact that almost all desirable single-word domain names have been taken, especially in the dot com (.com) domain. This includes popular domains like: www.house.com, www.books.com, www.cars.com, and many other similar domain names. These popular and short choices of domain names have been exhausted, and an obvious next step was to start registering domain names containing more than one keyword.

Human readers can easily distinguish separate words having been combined. For example, a human reader will assume that www.tabletsforsale.com is a website where he/she can buy tablets. However, search engines cannot make much sense from a domain name like www.carrentalcapetown.com. Since the four words making up the main part of this domain name are combined into one word, search engines will not associate this domain with cars, rental or the city of Cape Town. This is the case since "carrentalcapetown" is not a standard English word, and it is the main reason why domains with separate words concatenated without delimiters should not be used.

Based on this background, users are advised to, instead of www.books.com (taken already), rather use www.books-for-sale.com. Both human and search engine readers can make sense out of this domain name. It has been claimed that some users dislike this use of hyphens in domain names, arguing that it appears to be spamdexing.

On the other hand, the reality is that if a user wants to use a particular domain name which has already been registered, he or she will be forced to use a hyphenated domain name. No two different domains can have the same domain name. This is the root cause of the constant rush to be the first to register a popular or useful domain name.

2. Background to Research Problem

This research project focusses on issues that affect the visibility of websites, when using single-word domain names (e.g. CheddarCheese.com) versus hyphenated domain names, e.g. (Cheddar-Cheese.com). According to Weideman (2009a; 14) visibility is defined as the ease with which a search engine crawler can find and index a webpage. In the example above these names appear to be the same, but they are in fact different and can be registered and owned by two different entities.

The problem with hyphenated names is that, when users read names they often do not pronounce the dashes. For example "Cheddar-Cheese", could be pronounced as "Cheddar Cheese". A reason could be that if one owns the domain www.ford-motors.com, some of the traffic will go to www.fordmotors.com, since the dash is often omitted in speaking and even in writing.

According to Eagle *et al* (2011:1) search engine spamdexing denotes the manipulation of webpages with the sole intent to raise their position in search engine rankings. A number of factors have been identified which can have a negative effect on ranking – these include keyword spam, unethical inlink harvesting and others (Weideman, 2009b). This can cause confusion and a user can easily type a domain name without the hyphen, syphoning away some of the traffic from the target website.

On the other hand, too many hyphens can raise a red flag with the viewer on the quality and trust of the website. When considering some real-life examples, one popular website exists namely: www.expertsexchange.com. This is a website where the reading confusion comes in. One can easily read this as; Expert Sex Change instead of Experts Exchange. In this specific case, the owners were forced to register a hyphenated domain name called experts-exchange.com to ensure that the correct meaning is associated with the domain.

Another example is a popular site titled: www.DigitalPhotographySchool.com - this is easy to read when capitalised. However if one considers reading www.digitalphotographyschool.com, it is clear that this version can be difficult to read and type. This is where the use of dashes assists and ensures easy reading, hence www.digital-photography-school.com. See Table 1.

Against this background, it is important to note that website owners are locked in a constant battle for domination of high positions on search engine result rankings. Various systems exist to improve the ranking of a given webpage for a given search query: paid (pay-per-click) and unpaid (search engine optimisation) systems (Kritzinger *et al*, 2013). The choice of domain name plays a part in this game of fighting for positions.

Table 1: Hyphenated vs. non-hyphenated domain names.

Single-word	Hyphenated
www.webvisibility.co.za	www.web-visibility.co.za
www.fordmotors.com	www.ford-motors.com
www.expertsexchange.com	www.experts-exchange.com
www.digitalphotographyschool.com	www.digital-photography-school.com
www.facebook.com	www.face-book.com

From Table 1 it is clear that some concatenated names are made easier to read by adding dashes. This leads to the question: does it mean the owner of www.webvisibility.co.za must purchase www.web-visibility.co.za, or .com, .net, org, etc. to protect his/her trademark and to avoid confusion or abuse (Berners-Lee, 2004)? Answering this question is outside the scope of this research.

3. Literature Survey

A Web directory consists out of a list of webpages, normally compiled by humans as opposed to being machine-generated. This list of webpages is often categorised, based on the content topics. It often also has a short description and related URL's (Hart *et al*, 2003). Examples of such directories include Yahoo! and Dmoz. Domain specific search engines are search engines that only return webpages related to a specific domain. Google is not a domain-specific search engine (Oyama *et al*, 2004). An example of a domain-specific search engine is www.campsearch.com.

Domain names are associated with specific and unique IP addresses. For example Google's IP address is 64.233.171.101. However, it is easier for humans to read and remember names rather than numbers. The DNS (Domain Name System) helps to translate or associate numbers to names. Hence it is possible to simply type: www.google.com in a browser rather that the IP address.

4. Research Problem

The research problem was based on the title, and the facts emanating from prior reading. This lead to identifying the main problem, which is;

The effect of single-word versus hyphenated domain names on the visibility of webpages stored on those domains is unknown, leading to counter-productive choices.

5. Research objective

The objective of this research is to gain insight on domain name choices, and how users perceive them. A sub-objective is to determine the reasons why users might choose one type of domain name above the other. The research questions are listed in Table 2.

Table 2: Research Questions.

Research Question	Research Method	Objectives
How can the effect of domain name choice on website visibility be measured?	Literature review	To gain insight on name choices, and how users perceive them
- What is the effect of a single-word domain name versus a hyphenated domain name on website visibility? - What are the benefits of hyphenated or single-word domain names respectively? - Do users prefer using a hyphenated or a non-hyphenated domain name?	Literature review Literature review Questionnaire	Know the reason users choose to hyphenate a domain name or not to.

6. Design

The researcher used both exploratory methods of research, that is, qualitative and quantitative. Qualitative research refers to the measurement of attitudes on the usage of hyphenated and non-hyphenated domain names among different users. This approach also addressed the "why" questions, for example: why do users choose hyphenated or non-hyphenated names respectively for their domains?

This research has been conducted on a limited number of respondents. They were selected randomly, and the following attributes of each were recorded:

- Users' level of education
- Gender difference
- First-time users, or regular users of the Internet

This data enabled the researcher to compare statistics on the research questions, and assisted in producing an objective opinion based on the data provided by the users.

7. Methodology

This is a survey-oriented research study since no experiments were conducted. The research explored the use of single-word and hyphenated domain names in website visibility.

The research used the qualitative and quantitative data-collection methods. According to Neuman (2006), the qualitative data-collection method does not deal with the measurement of numbers; it deals with a description of the units of analysis and units of observation being studied. Because both methods of research are used, it is important to note the difference. Secondly, quantitative research is another well-established methodology. According to Kasim *et al* (2010), quantitative research refers to the empirical investigation, in a systematic way, of social phenomena. In the process, mostly statistical, mathematical and/or numerical data is gathered, and computational techniques are used to rework and present this data.

The research describes the opinion of users regarding the use of domain names. This information is presented in the form of descriptive and numerical data.

A questionnaire proved to be the best approach for collecting information from users, due to various constraints on the research. It was done online to harvest a wider audience and this proved to be effective. The questionnaire posed in-depth questions, where the respondents were asked a combination of open-ended and binary questions.

Participants included users who are current students, post-graduates, matriculants, and some with basic education, but with some Internet knowledge. These proved effective as the above-mentioned users make extensive use of the Internet.

The research was also based on a literature review that describes the present form of domains and the nearby foreseeable future.

8. Results and Analysis

The survey was conducted with 20 participants, ranging from 18 to 74 years old. Some participants skipped the answers to some of the questions. Education ranged from some basic education to post-graduates, and also a mix between males and females. The questionnaire addressed the issues as listed below.

8.1 What is the effect of single-word domain name versus a hyphenated domain name on website visibility?

From the results, 84.2 % of users preferred not to use hyphenated domain names, for various reasons. Users generally do not use domain specific search engines.

It was not clear what the effect of hyphens in domain names on website visibility is. Users try to register non-hyphenated domain names first, but due to the millions of registered single-word domain names, this is not always possible. However, due to the fact that the survey was not wide enough to successfully answer this question, this can be useful for further research on this topic.

8.2 What are the benefits of hyphenated or single word domain names?

In the survey, a large fraction of the participants (over 80%) preferred non-hyphenated domain names (refer to Figure 1), and their answers showed a lot of similarities. A summary of their opinions indicated that:

Hyphenated domain names are:

- Very complex
- Not user friendly
- Difficult to remember

Non-Hyphenated domain names

- Easier to remember
- Easier to type out one name
- It's easier to type single words than having hyphens in between

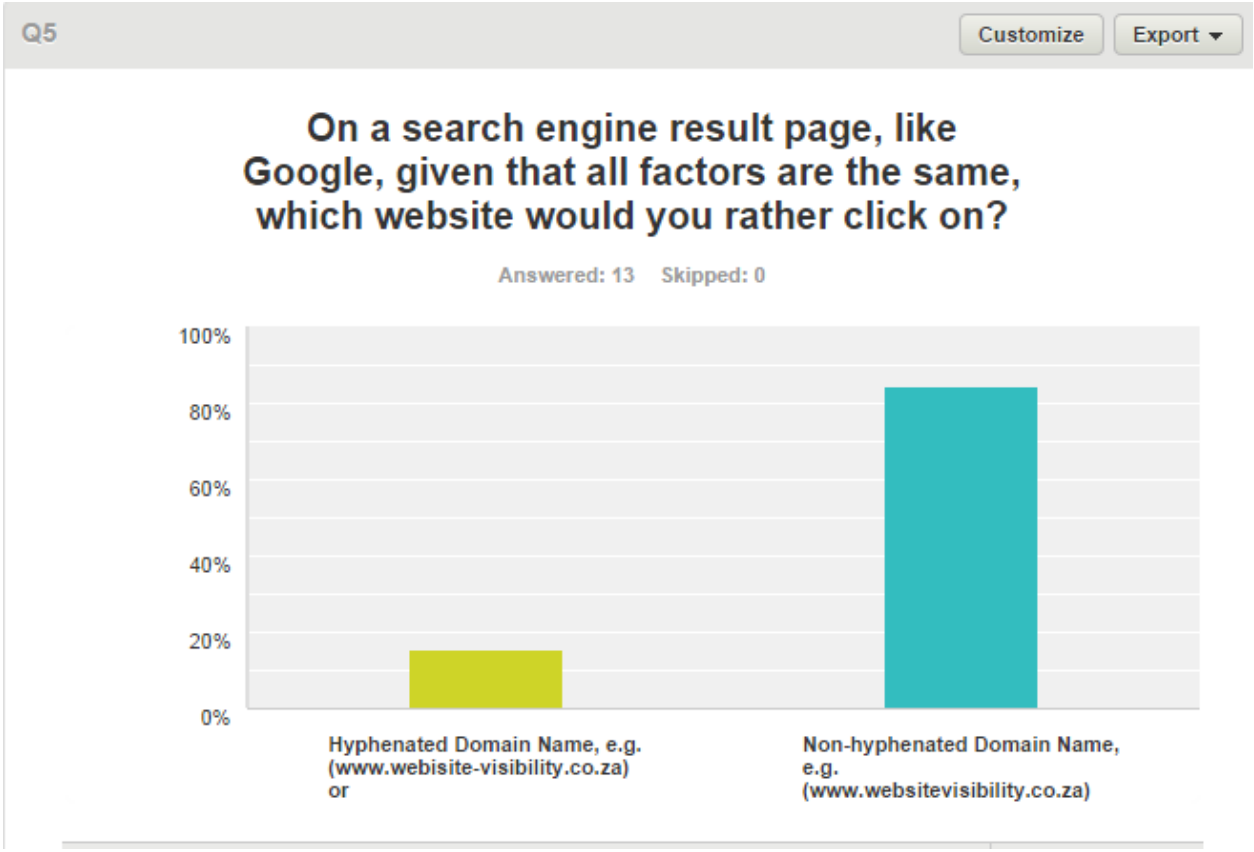

Figure 1: Comparison of domain names.

8.3 Do users prefer using a hyphenated or non-hyphenated domain name?

Judging by the results, most users prefer non-hyphenated domain names. Although a few like to use hyphenated domain names for various reasons, the majority who completed the survey prefer the other way round. Figure 2 indicates that 70% of the total number of participants prefers to use non-hyphenated domain names.

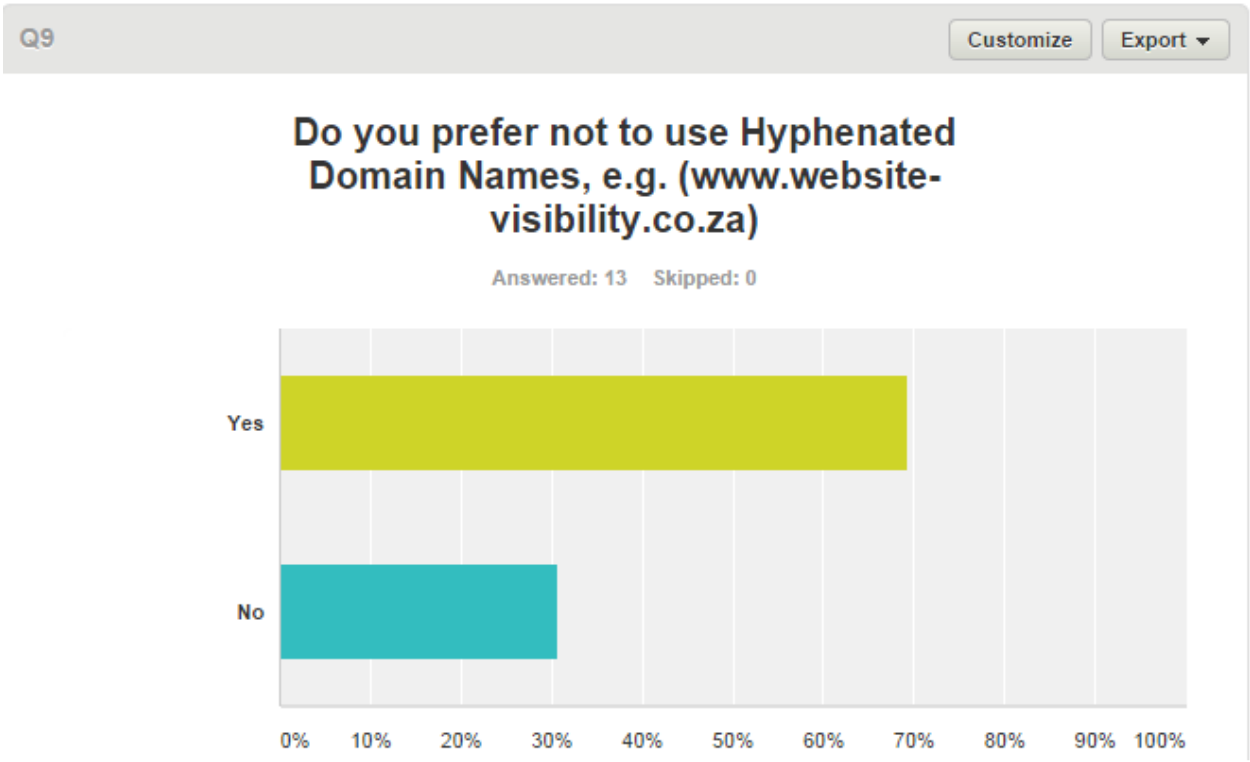

Figure 2: User opinions on domain names.

Level of education and gender were also analysed, and Figures 3 and 4 list the results.

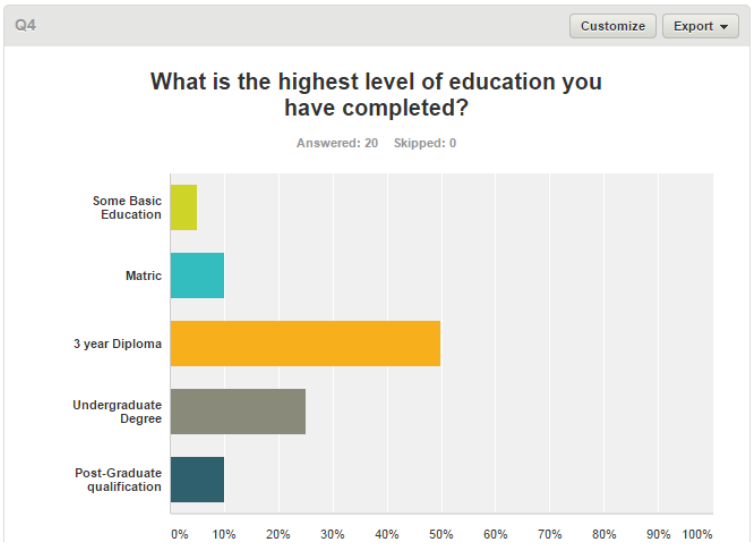

Figure 3: Education level analysis.

It is clear that by far the biggest category of participants were from the centre category – those with a 3-year diploma. The result graph has a typical bell-shape, indicating an even spread across all levels of education.

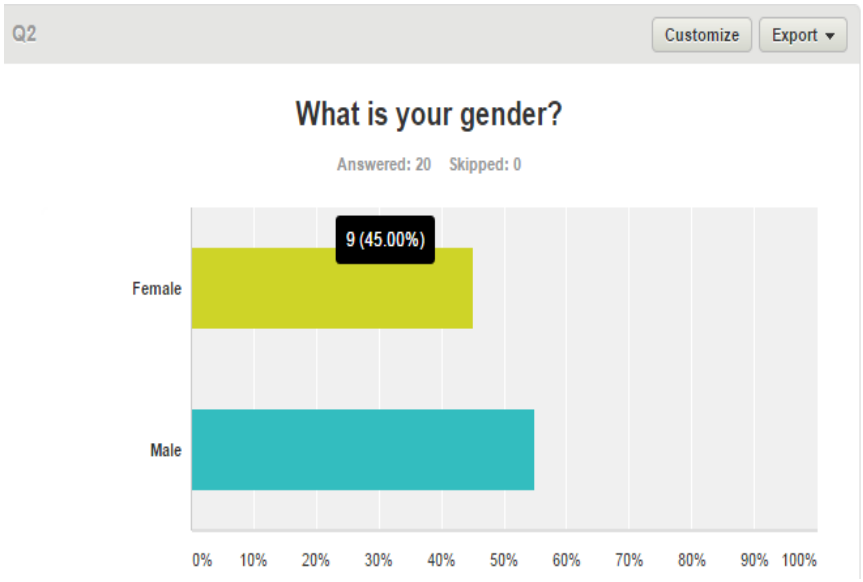

Figure 4: Gender analysis.

The spilt between genders was fairly equal, with males representing 55% and females 45% of the total.

9. Limitations of the study

Firstly this research was an exploratory study, with a small number of respondents. As such it will not be fair to generalise the findings. It is suggested that collaboration with ISP (Internet Service Providers) will benefit future research. Getting list of domain names to be used as examples from ISPs would allow the research to have a bigger impact, and may present a fairer view of user perception. Increasing the sample size would help to generalise findings.

10. Conclusion

The research showed that 84% of the respondents preferred non-hyphenated domain names. Non-hyphenated domain names are clearly visible and easy to remember.

The relationship between single-word and hyphenated domain names and their effect on website visibility was not clearly identified, and presents an opportunity for future research.

The research produced results which can assist in understanding users' perceptions on domain names, which could produce better choices of future domain names. It was also important to identify the reason why some users prefer not to use hyphenated domain names.

11. Glossary

- DNS: Domain Name System - it translates IP addresses to names.
- Domain name: an address in words used to identify one or more IP addresses.
- Domain specific search engine: a search engine that is limited to a set of domains.
- Hyphenated domain name: A domain name separated by dashes or hyphens.
- IP Address: A unique identifier for a computer on the Internet, represented by numbers.
- ISP: Internet Service Providers, an example of this would be companies like MTN, Telkom, Vodacom, etc. that provide telecommunication services to users.
- Non-hyphenated domain name: a domain name containing one or more hyphens.
- Spamdexing: (also known as search engine spam, search engine poisoning, search spam or web spam) is the deliberate manipulation of search engine result pages.
- Web directory: a list of webpages compiled by human editors
- Website visibility: is defined as the ease with which a search engine crawler can find and index a webpage.

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