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Introduction

- 1 Real estate professionals often say there are three important parameters to take into account when purchasing a house or a flat: location, location and location. We could not agree more in the context of the internet: domain names are the cornerstone of our digital economy. The analogy with the housing market does not stop there. Just as an investment in a house is ongoing (from the minor maintenance of wooden floors to major renovations of the roof, for example), the investment in a Uniform Resource Locator (URL) does not stop at acquiring a domain name. Commercial parties are very much aware of the importance of URLs, illustrated by practices such as the domain name aftermarket where URLs are bought and sold by commercial parties. The gradual evolution towards a more structured and Semantic Web, combined with the Internet of Things, will emphasise the importance of stable and meaningful domain names [van Hooland and Verborgh, 2014].
- 2 This article proposes an in-depth study of URLs with the top-level domain name (TLDN) .brussels. Why is the particular case of .brussels interesting to analyse? Compared to many of the other newly created TLDNs, such as .music or .photography, the range of usage is potentially much more diverse. Even when compared with other geographic

TLDNs which reflect city names, such as .gent for example, the eight letter term “Brussels” is being used in a wide variety of contexts. The disambiguation page on Wikipedia gives us an overview of the different meanings:¹

- the city of Brussels
- the region of Brussels
- the capital of Belgium, the Flemish and the French Communities
- the metonym for the different institutions of the European Union (EU) and the European Commission (EC) in particular
- five different cities in Canada and the United States

- 3 This ambiguity is put into light in the context of Linked Open Data (LOD), as reported by De Wilde [2015]. The resource for Brussels is well represented in LOD datasets. Its DBpedia page² lists 128 equivalent resources in various knowledge bases such as Freebase and LinkedGeoData, as well as Global Administrative Areas (GADMs). Among these, we have found two URLs from GeoNames: <http://sws.geonames.org/2800866/> and <http://sws.geonames.org/2800867/>. The former corresponds to Brussels as the capital of a political entity, and the latter, to Brussels Capital as a first-order administrative division. The first has a population of 1 019 022, the second, of 1 830 000. So how can these two URLs *actually refer to the same thing*?
- 4 The March 2016 terror attacks and Donald Trump’s “[Brussels] is like living in a hellhole”³ quote also demonstrate how rapidly the semantics associated with a term can result in very different concepts. Frege [1960: 60] draws a distinction between the idea, the sense, and the reference of an object:

The reference of a proper name is the object itself, which we designate by its means; the idea, which we have in that case, is wholly subjective; in between lies the sense, which is indeed no longer subjective like the idea is, but is not, however, the object itself.
- 5 Even when the reference of Brussels is agreed upon (e.g. the capital city and not the European institutions), the idea Trump has of Brussels is drastically different from that of the average city dweller. The sense put into the concept of Brussels can therefore vary quite radically, allowing a whole range of interpretations. We hope that these examples demonstrate the richness but also the complexity of the .brussels TLDN across its potential uses.
- 6 After a short introduction to the intriguing world of domain name registration, the article introduces the case study and details the methods used to perform both the quantitative and qualitative analyses. The article ends with a discussion of the results.

1. A rough guide to the domain name market-place

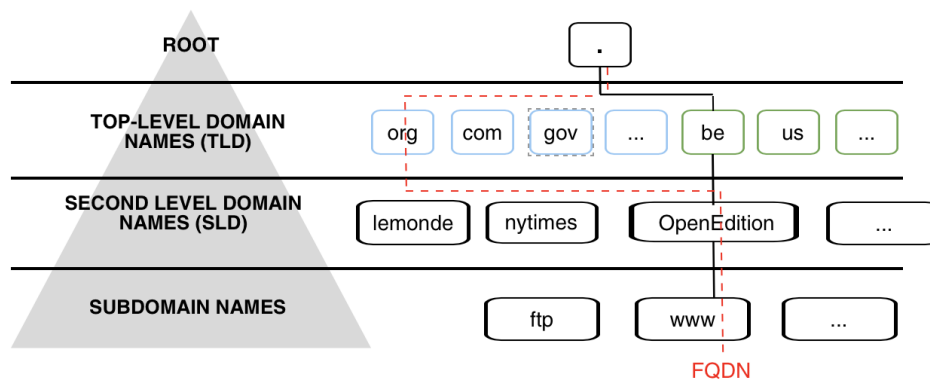
1.1. From IP addresses to the Domain Name System (DNS)

- 7 In order to have a better understanding of the role of the Domain Name System (DNS) on the internet and the impact of domain names on the images we build online, let us first have a brief look at its foundations.
- 8 The Domain Name System was introduced in the early 1980s in order to simplify the use and the management of IP addresses. An IP address is a series of numbers⁴ acting as unique identifiers, which are assigned to each entity connected to the internet. The

increase in the size of networks and the growing number of hosts led to problems regarding the organisation, flexibility and management of the names and their corresponding IP addresses. There was a need to structure the growing amount of data, divide data administration between more servers in order to decrease the weight of downloads, and finally, to delegate the administration of name servers due to their increasingly complex management.

- 9 Thus, in 1983, researchers at the Information Science Institute of the University of Southern California, including Jon Postel and Paul Mockapetris, designed the Domain Name System. The DNS is an optimised implementation of the concept of the name server on the internet, based on a hierarchical structure of different “zones” corresponding to different portions of the “namespace” [Aitchison, 2011: 4].

Figure 1. DNS Hierarchy



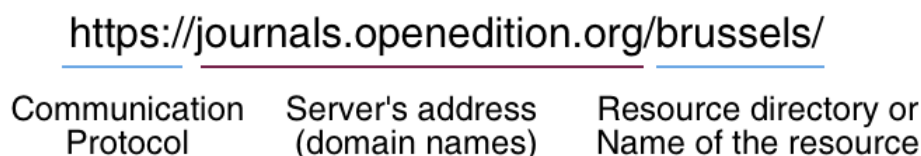
- 10 The first zone on the top of the hierarchy of the DNS is called the root zone, as shown at the top of Figure 1. It is represented by a point, often referred to as the “silent dot” (because we do not usually refer it). This first zone is followed by a second zone, which contains the Top-Level Domains (TLDs). As we can see, they are divided in two groups: generic Top-Level Domains or gTLDs (.com, .org, .int, .edu, .mil, .gov, .net and .arpa) and the country code Top-Level Domains or ccTLDs (.be, .fr, .us, .jp, etc.). These Top-Level Domains are followed by Second-Level Domains (SLDs), and so on. While the choice of Top-Level Domains is limited, the choice of Second-Level domains is limitless. Each combination is unique and has an exclusive semantic value.
- 11 The authority in charge of the root zone supervises which Top-Level Domains are visible in the namespace. In fact, each “name” is assigned to an authority, which may in turn oversee lower entities (names). This means that the entity in charge of the root zone controls the whole system.
- 12 Currently, the Internet Corporation for Assigned Names and Numbers (ICANN) owns the root zone. The ccTLDs were administered to the corresponding countries, and the gTLDs, to a few organisations (“registries”).

1.2. Role of the Domain Name System

- 13 The core principle of the internet is to offer a consistent and standardised platform so that different entities can communicate with each other quickly and easily and share data. To find something online, you need to be able to identify and locate the information

you seek. To do so, you will need common communication procedures such as the use of a common language. Identification, location and language can take various forms depending on their context. On the internet, the vectors of these three principles which allow anyone to find anything they want online are the URLs.

Figure 2. URL breakdown



- 14 Let us take a closer look at the information contained in a URL with the use of an example (Figure 2). First, there is the common communication protocol used on the internet, the HyperText Transfer Protocol (HTTP). This protocol allows the different components of the networks involved to understand each other by using the same “language”. Then, we distinguish the domain name “journals.openedition.org”, which corresponds to the Internet Protocol (IP) address of the resource of interest, allowing it to be located on the networks. Finally, we notice the resource directory and/or the resource name itself.
- 15 Most of the time, we will only retain the part containing the domain names because they are easy to remember. From there, web browsers have made it possible to access any resource through their simple use. Originally, domain names were not intended for end users, but their semantic value made them real standards online with the advent of the internet, which was opened to commerce in the early 1990s.

1.3. The new generic Top-Level Domains

- 16 There has always been some discussions about how and when new Top-Level Domains would be added to the Domain Name System. Since the arrival of the internet in the mid 1990s, DNS has encountered some changes and was endowed with a kind of economic value [Mueller, 2004: 105]. Used as the top-level directory for URLs, domain names went from referring network resources to referring content resources. They became real benchmarks online.
- 17 Until 2012, the system had only 22 gTLDs: .com, .arpa, .net, .org, .info, .biz, .mobi, .tel, .name, .asia, .pro, .cat, .jobs, .travel, .gov, .coop, .edu, .aero, .museum, .int, .mil and .xxx. Since the eight original ones (.com, .org, net, .edu, .gov, .arpa, .int and .mil), ICANN added a few more, but remained very strict regarding their selection, although we may already distinguish some geographical ones as well as some which refer to more specific businesses.

- 18 It was only 14 years later that ICANN decided to open the system to a massive application period. With a \$ 185 000 application fee, everyone has the possibility to apply for a Top-Level Domain. On 13 June 2012, ICANN announced that there were 1 930 requests. This number was much higher than expected. Even if they were quite discreet regarding the expected results, they never thought it would be such a success.⁵ More than 751 different candidates were involved in the 1930 applications. The most popular requests were for .app, .home, .inc and .art. When a TLDN is coveted by candidates with equal legitimacy, two options are offered: either they settle the dispute internally, or an auction is organised and the extension goes to the highest bidder [Nazzaro, 2014: 39-40]. Five years later, the applications are still being processed and new Top-Level Domains continue to enter the namespace. The applications came from all over the world: 911 from North America, 675 from Europe, 303 from Asia-Pacific, 24 from Latin America and the Caribbean and 17 from Africa (ICANN, 2012).
- 19 Belgium also took part of this huge revolution through the addition of three new geographic Top-Level Domains: .brussels, .vlaanderen and .gent. The first two TLDs were registered by the DNS Belgium registry (also administering the .be) and the last one was acquired by the Combell registry and the city of Ghent. Let us now proceed with a detailed analysis of the uptake of the .brussels TLDN.

2. Case study: the uptake of the .brussels top-level domain name

2.1. Background of the introduction of .brussels

- 20 The story of .brussels begins in 2011, when DNS Belgium announced that the three Belgian regions (Flemish, Walloon and Brussels-Capital) and the German-speaking Community that they could apply for new Top-Level Domains.
- 21 The Flemish and the Brussels governments went along with the project and made a tender to find a partner which could handle the acquisition process at ICANN and the technical maintenance of the new Top-Level Domains. The non-profit organisation, DNS Belgium, was chosen for both, and submitted an application for .brussels and .vlaanderen in 2012.
- 22 To apply for a new gTLD you had to be an established corporation, organisation or institution, pay an evaluation fee of US \$ 185 000 and fulfil the rules of ICANN's applicant Guidebook. Once the application period was closed, ICANN started the evaluation process. The order of assessment was based on the principle of a lottery. Each candidate had to pick a passage number. DNS Belgium was quite lucky, and the two extensions were released in June 2014. Whereas DNS Belgium administers the technical maintenance of .brussels, the city of Brussels does all of the marketing promotion around it. The wordplay be.brussels is now fully part of the city's communication and marketing strategy.

2.2. Harvesting of the research data

- 23 In order to analyse the uptake and usage of the .brussels TLDN, we acquired the full list of all .brussels domains registered until the beginning of March 2016. We requested the data

through the Centralized Zone Data Service (CZDS) of ICANN at the end of February. The DNS Belgium registry approved the request on the 3rd of March and provided us with the entire zone file of its own .brussels extension. This list, containing 7 258 lines, was given to us in a *.txt file.

- 24 Some particularities and data quality issues were present in the file. After a quick look at the file, we noticed that certain domain names did not make a lot of sense, such as for example 0037thqst4en3so3ahg8c83b6k5bsals.brussels. These apparent non-sensical URLs are used in the context of the DNSSEC protocol.⁶ We achieved most of the cleaning and data pre-processing using OpenRefine [Verborgh and De Wilde, 2013],⁷ an open-source data transformation tool, as will be described later in this section.
- 25 Both a quantitative and a qualitative approach were used to delve into the corpus and analyse its contents. While the quantitative analysis made use of the whole corpus, we resorted to the creation of a representative sample for the manual, qualitative study of the .brussels domain name.

2.3. Quantitative approach applied upon the full research corpus

- 26 Using OpenRefine, we have cleaned the corpus and exported a *.txt file containing 5 908 domain names, with one domain name per line.

2.3.1. Percentage of redirections

- 27 If the domain name as such is not being used, it is possible that it is redirected. The intention behind verifying redirections is to determine whether .brussels domain names are widely used as main domain names, or if they are mostly used as a defence mechanism against domain squatters. In order to do just that, we used an existing script⁸ to test whether a URL is redirected or not. Originally, the script takes a *.csv file as input, consisting of two columns: the first one contains the URL that is being tested, and the second one is the URL where the first one should be pointing. The script then checks and writes the results in two separate files, one where there is a redirection – an HTTP 301 status⁹ – and one where there is not. In our case, since we wanted to verify whether domain names were being redirected or used primarily, the two columns of the input file contained the same content. The results of the script are presented in Table 1: out of the 5 908 domain names tested, 22,7 % were redirected. Nonetheless, those results should not be taken at face value: not being redirected does not necessarily mean the domain name is being used, as many of those non-redirects point to nothing (404¹⁰) or to the confirmation that the domain name has been purchased – some registrars automatically create a page on newly bought domain names attesting that the domain name is no longer available.

Table 1. HTTP 301 vs. No HTTP 301

	HTTP 301	No HTTP 301	Total
Raw count	1338	4570	5908
%	22,7	77,3	100

2.3.2. Who owns .brussels domain names?

28 Another interesting source of information about domain names is their owners. As is the case for real estate, do conglomerates speculate on a range of domain names? In order to determine this, we used WHOIS, a protocol – as defined by Wikipedia – used to “[query] databases that store the registered users of assignees of an internet resource, such as domain name, (...)”.¹¹ For privacy and commercial reasons, most non-commercial tools and websites limit the number of queries a single user can make per day. We have found out that the limit for the .brussels TLD, using the latest Debian Jessie WHOIS client,¹² was of 60 queries per day per IP. In order to overcome that limitation – for research, and not commercial purposes – and correctly query the data for our 5908 domain names, we split our original file into 99 60-domain name files and added the WHOIS command to each line. The final files that were launched from 99 separate IPs bore the following structure:

29 whois -H 0800flowers.brussels
 whois -H 10.brussels
 whois -H 1000.brussels
 whois -H 100masters.brussels
 whois -H 100percentbrussel.brussels

30 The results of the WHOIS querying were interesting. It appears that the most common registrant is the CIRB-CIBG,¹³ the branch of the Brussels government in charge of introducing new technologies, with a total of 1 437 domain names. The domain names tend to be “public service”-oriented, and are mostly names of police zones, postcodes or names of municipalities or names of government branches. The second most represented registrant for the .brussels TLD is a private company¹⁴ described on its website as “[being] currently interested in purchasing high quality generic domain names that do not infringe on anyone’s intellectual property rights such as grants.com, robot.com, and earth.com”, with 64 unique domain names. After them, the list is composed of Belgian private citizens – one of them not being from Brussels – (54, 50 and 44 domain names, respectively), followed by the American multinational company, Apple, with 27 domain names. In total, there are 1 877 unique registrants. If we remove the 1 437 domain names of the CIRB-CIBG, it appears that the average number of domain names per registrant is of 1,76. This relatively low number seems to indicate that .brussels is not really the victim of large consortium which purchases all domain names.

2.3.3. Where do .brussels domain name owners come from?

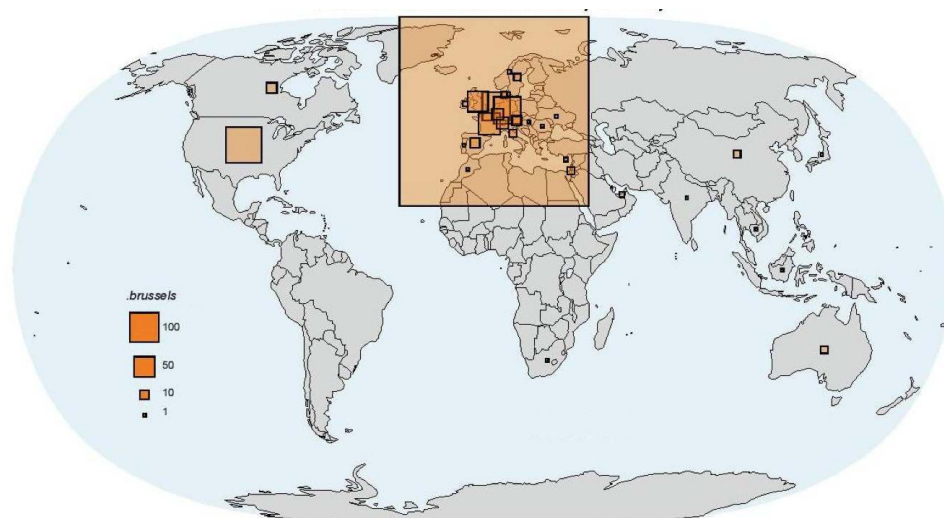
31 With the personal information available in the WHOIS databases, it is also possible to determine the origin of the registrants. A breakdown of these data per country of origin is available in Table 2. Note that the information in the WHOIS databases are provided by registrars and registries for the domain names they promote. The access to this information is not a constraint. Some registrars and registries offer privacy or proxy services to allow users to hide some personal data. This is the reason why we do not know the country origin of 172 .brussels domain name owners we analysed.

Table 2. Domain names per country of registrant

country of registrant	number	country of registrant	number

BE	4 200	DK	4
US	151	AE	3
NL	92	IE	3
DE	84	CY	2
FR	56	NO	2
GB	48	VG	2
CH	16	ZA	1
LU	14	HU	1
CA	13	ID	1
ES	11	IN	1
AT	10	JP	1
IL	7	KH	1
IT	7	MA	1
AU	6	PT	1
CN	6	RO	1
SE	6	UA	1
DK	4	(blank)	172

- 32 Figure 3 shows the geographical distribution of .brussels TLDNs by country at world level. On 4753 domain names spatially registered, a very large majority (88,8 %) have actually been acquired in Belgium. Otherwise, logically, most .brussels TLDNs are in the European Economic Area (EU and EFTA), with two thirds of registrants outside Belgium. In this part of the world, .brussels is concentrated in the countries neighbouring Belgium, most notably in the Netherlands and Germany. For the rest, the registrants are located in other developed countries, mainly in the United States, but also Canada, Australia and Israel. Lastly, it should be pointed out that the .brussels domain name is also registered in a few emerging countries such as China, but also in some developing countries, with (Morocco) or without (Indonesia, Cambodia) strong links to Belgium.

Figure 3. Number of .brussels TLDNs acquired by country

SOURCE: CENTRALISED ZONE DATA SERVICE OF ICANN. AUTHOR. J-M. DECROLY

- 33 This strong correlation between .brussels and the high rate of registrations in Belgium is fairly obvious given that it is a geographical domain name. According to the owner of the Brussels Bed and Breakfast “All In One”, purchasing the domain name .brussels seemed like an obvious choice since there is a direct link to the city of Brussels. “When people look up “Bed and Breakfast in Brussels” or “BB Brussels” online, they always come to .be or .com websites. There were not many .brussels taken at that time, that is why we registered all domain names linked to our activity and company’s name under .brussels.” (Waltery Vincial)¹⁵. For Hello-Hostel.brussels, having the name of the city where they are located in the website address is also useful information for customers. Although their .brussels address redirects to their central .eu address, .brussels is used as a geographical keyword.

2.3.4. How many characters does a .brussels domain name typically contain?

- 34 A last element that can be analysed for the entire corpus is the length repartition of the domain name. It might seem nonsensical to do so, but a certain number of the new TLDNs are often used in order to reduce the length of a domain name. For example, domain names such as <http://del.icio.us/> or <http://flic.kr> integrate the extension as an integral part of the semantics of the URL. Analysing the average length of the domain names can give an indication of this phenomenon.
- 35 Table 3 shows us that more than half of the domain names have a length ranging from five to ten characters, which can be interpreted as a sign that .brussels is not necessarily purchased to significantly reduce the length of the domain name. Mounir Laarissi¹⁶, owner of Brussels Cleaning Industry, wanted to register his online address under the acronym BCI. Given that BCI.be was already taken, using .brussels was a great alternative and even an advantage in order to specify the company’s location and identity. For him, the length of the first level domain name did not matter, as long as it was significant. On the other hand, being able to use the company’s acronym was the most important.

- 36 To the great advantage of many, the introduction of new top-level domain names has made a range of names accessible again.

Table 3. Length repartition of the domain names

length	number	length	number
8	596	22	31
7	585	23	25
6	523	24	20
9	471	25	16
10	451	26	9
5	414	28	9
4	409	30	9
11	362	2	8
3	356	32	7
12	307	27	6
13	280	29	5
14	207	33	3
15	190	34	2
17	153	35	2
16	140	37	2
18	105	39	2
19	88	31	1
20	76	36	1
21	48	38	1

2.4. Qualitative analysis based on a sample

- 37 In order to gain a more fine-grained understanding of the dataset, we set out to select a sample to be analysed manually. Basing our selection on a 99 % confidence level and a confidence interval of 5, we determined that we needed a sample of 592 domain names. The selection was carried out randomly, since we feared that variations of the same

domain name¹⁷ would prevent proper representativeness. To do so, we created a python script¹⁸ which added all domain names to a list, shuffled the list using the random python library and extracted the first 592 domain names of that list.

38 Secondly, a set of questions was established in order to guide the analysis. A pragmatic balance had to be found between a sufficient number of questions in order to obtain sufficiently detailed results, but the number of questions also had to be limited in order to keep the manual analysis feasible. A set of eight questions was identified, for which we obtained the following results:

- **Parked:** Domain parking “refers to the registration of an internet domain name without that domain being associated with any services. This may have been done with a view to reserving the domain name for future development, and to protect against the possibility of cybersquatting”.¹⁹ Typically, either a message such as “Under construction” is shown, or advertisements are used to monetise the eyes viewing the page.

For our corpus, **25,34 %** of the URLs are parked.

- **Speculation:** A so-called *domain name aftermarket* appeared quite quickly after the uptake of the internet in the 1990s. As with real estate, people invest in domain names with the sole purpose of reselling it at a higher price. A typical example here is <http://photography.brussels>, which is offered for sale at the price of \$ 9 999. We only considered a domain name to fall into this category if the webpage explicitly mentioned that the domain name was for sale. Some investors in domain names might decide not to put a specific message online and use other marketing methods to sell the domain name, or just simply wish to wait and see how the market evolves. These approaches are therefore not represented in our results and the percentage obtained should therefore be considered as a lower figure.

For our corpus, **2,87 %** of the domain names are offered for sale in an explicit manner.

- **Language:** Identification of the language used on the website. The following languages are represented in our corpus:

- Multilingual: 159
- French: 29
- English: 23
- Dutch: 19
- German: 2
- Japanese: 1
- Spanish: 1

It comes as no surprise that the majority of websites are offered in more than one language, given the multicultural and multilingual aspect of Brussels. In fact, this multilingual category includes Dutch, French, English and a few German translations. However, it should be noted that there are more websites in French than in English or Dutch.

- **Redirection:** This happens when a webpage has no actual content, but just forwards to another URL. This is the case for example with <http://artnouveau.brussels>, which redirects the user to <http://patrimonium.brussels>. Redirection is mainly used to lower the impact of synonymy and alternate spellings upon users by offering them multiple entry points.

For our corpus, **27,20 %** of the domain names are redirected towards another URL.

- **Sector:** Identification of the sector of activity of the webpage. By analysing in an iterative way the content of the websites, a list of the most prominent sectors of activity has been identified. When a certain subcategory of an activity is prominent in its own right, a class of its own was created, which happened in the case of culture, tourism, transport (or even politics) which can be considered as a subactivity of services.

- Services (51,28 %): more than half of the websites offer services, including hotel and catering trade, education and medical services, for example.
- Commerce (18,38 %): almost one fifth offer products for sale.
- Culture (11,54 %): more than one tenth of the websites promote cultural activities.
- Transport (10,68 %): this might seem surprising, but it is mainly due to the high number of domain names bought by STIB.
- Tourism (3,84 %): websites promoting tourist events within Brussels.
- Personal websites (2,14 %): personal websites of individuals, representing their work or hobby activities.
- Politics (2,14 %): websites to promote political parties or individuals.
- **Public: 18,58 %** of the domain names are explicitly associated with a public service.
- **Brussels: 28,21 %** of the analysed websites are directly or indirectly associated with the city or the region of Brussels. Note that 35 % of the analysed URLs are not active and 25 % refer to parked domain names. Only 40 % of the analysed sample point to actual “used” websites (including redirections). This helps to understand why only 30 % of the analysed URLs are linked to Brussels. As mentioned above, most of these domains are registered by the public sector and are associated with services.

Discussion

- 39 Let us come back to our initial question: how hot is .brussels? Recent articles in the press have clearly given a negative answer to the question. *La Libre Belgique* wrote “Limited success for the .brussels domain name” and the city journal Bruzz, “The .brussels domain name still no success”.²⁰ At the launch of .brussels, DNS Belgium expressed that it expected to sell 50 000 domain names over a period of 5 to 10 years. The uptake of the 7 258 registrations in March 2016 remains below these expectations.
- 40 With this article, we would like to develop a less commercial view of the appeal of .brussels. One of the key outcomes of this article is that the .brussels domain name remains very much a niche player. However, as citizens of the internet and lovers of Brussels, is this actually a bad thing? Within the press, the limited uptake of .brussels is interpreted as a failure, using the unique point of view of DNS Belgium, the seller of the new domain names. However, the uptake of .brussels may be interpreted from different angles.
- 41 In order to make a case for our argument, let us refer to the metaphor of the real estate industry. If there are only a few transactions in a certain part of a city, real estate professionals will most certainly deplore the lack of activity and regret that there is no massive arrival of buyers, who more often than not are short-term speculators. Individual families who buy a historic house and put effort into its renovation and contribute in the long term to the development of rich community and neighbourhood life, do not represent very many transactions and do not necessarily have a big impact on the global statistics of the real estate industry. However, from a city planning and long-term perspective, these little individual investments can develop over time into small hubs which contribute significantly to the quality of life in a neighbourhood.
- 42 In this sense, we would like to nuance the negative arguments in the press, which only focus on the economical impact of the lagging domain name sales for DNS Belgium, and to draw attention to the value of .brussels as a niche player which has not fallen prey to speculation. Even if less .brussels domain names have been acquired than expected, it is

interesting to try to discover tendencies in decisions to create a new website or relocate an existing one under .brussels. The last section has given an overview of the results for a limited set of questions we asked the entire corpus of registered domain names with the new TLDN .brussels, by using computational methods and a sample set, allowing us to delve a bit deeper with manual analyses.

- 43 A relatively large portion of the domain names tend to be “public service”-oriented, and consist mainly of police zones, postcodes or names of municipalities or names of government branches. Specific players active as investors have definitively acquired .brussels domain names to some extent, but a large portion consists of Belgian private citizens. If we remove the 1 437 domain names of the CIRB-CIBG, it appears that the average number of domain names per registrant is of 1,76. This relatively low number seems to indicate that .brussels is not really the victim of large consortium purchasing in bulk domain names. This tendency is also reflected in the fact that 71,1 % of the .brussels domain names have been registered by persons or organisations based in Belgium.
- 44 As Thierry Brunfaut, director of the marketing campaign of be.Brussels, mentions on the project website, “logos, however pretty, are no longer sufficient to build a brand. What makes brands vibrant and strong is their capacity to engage users and build strong connections”.²¹ This is a strong example of how the .brussels TLDN has been used to complement and boost a traditional visual marketing identity. There is an important interaction between the design and marketing of a website, and how .brussels is being operationalised. For example, <http://urbanisme.brussels> is for the moment being redirected towards <http://urbanisme.irisnet.be>, but the graphic identity of this website already refers to .brussels, which implies that a future move is in the making. As mentioned in an interview with the owner of a bed and breakfast who has bought about 20 domain names: “.be and .com don’t mean anything, whereas the usage of .brussels is immediately tied to the city”. One could consider .brussels as a valuable extra layer of metadata which makes it clear to the end user that the website is related to the city or region of Brussels. Not only city marketing but also activism immediately linked to the territory of Brussels, such as for example <http://mortsdelarue.brussels/>, illustrate the power of .brussels to make a clear link to the city in the domain name.
- 45 We can therefore end with a positive message: the amount of large commercial players has remained limited, leaving sufficient room for small and local players with a clear connection to Brussels to acquire a domain name with strong semantics. This is good news for webmasters as well as for end users. However, this does not mean that the uptake of .brussels should not increase significantly over the years. When interviewing owners of a .brussels, the recurring comment was that end users are often not aware of the existence of .brussels and even think there is an error in the URL when confronted for the first time with a URL ending in .brussels. Promotion and awareness-raising should therefore certainly take place over the next years, but we feel that it is good for the uptake to happen slowly instead of being confronted with a rush for large numbers of domain names, which could just reflect speculative behaviour.

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NOTES

1. [https://en.wikipedia.org/wiki/Brussels_\(disambiguation\)](https://en.wikipedia.org/wiki/Brussels_(disambiguation))
2. <http://dbpedia.org/page/Brussels>
3. As reported by Business Insider: “You go to Brussels – I was in Brussels a long time ago, 20 years ago, so beautiful, everything is so beautiful – it’s like living in a hellhole right now”. The day after these comments, a citizen reacted by launching <http://hellhole.brussels> to counter attack.
4. Or, in the case of the most recent version of the Internet Protocol (IP), IPv6, a series of numbers and letters.
5. Matthieu Crédou, Chief marketing officer at Afnic, Association française pour le dommage Internet en Coopération (Interviewed on March 30th 2016 – Skype conference call)
6. More information can be found at <https://ensiwiki.ensimag.fr>
7. More information and guidance at <http://freeyourmetadata.org>
8. Available at <https://github.com/djenvert/test301>
9. <https://httpstatuses.com/301>
10. <https://httpstatuses.com/404>
11. <https://en.wikipedia.org/wiki/WHOIS>

12. The package is present by default on any Debian installation, and is available at <https://packages.debian.org/source/jessie/whois>.
 13. <http://cirb.brussels/>
 14. The authors have decided not to disclose the name of the company.
 15. Walterny Vincial, Manager of the “All in one” Bed and breakfast (Interviewed on April 27th 2016 – phone call)
 16. Mounir Laarissi, Director of the “Brussels Cleaning Industry” company (Interviewed on March 21st 2016 – phone call)
 17. E.g. fullglassrailing.brussels, full-glassrailing.brussels and full-glass-railing.brussels.
 18. Available at <http://howhotis.brussels>
 19. https://en.wikipedia.org/wiki/Domain_parking
 20. See <http://www.lalibre.be/regions/bruxelles/succes-mitige-pour-le-nom-de-domainebrussels-57507f5735708ea2d6189236> and <http://www.bruzz.be/nl/actua/domeinnaambussels-nog-geen-succes>
 21. See the description of the marketing campaign at <https://basedesign.com/case-study/bebrussels>
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ABSTRACTS

The opening up of the top-level domain name market in 2012 has offered new perspectives for companies, administrations and individuals to include a geographic component within the domain name of their website. Little to no research has been carried out since then to analyse the uptake of the new top-level domain names (TLDNs). Based on the specific case of the TLDN .brussels, this article proposes an empirical study of how the opening up of the top-level domain name market actually impacts registration practices. By making use of freely available software tools such as OpenRefine and Natural Language Processing (NLP) methods, the entire corpus of the .brussels domain names (6 300) was analysed from a quantitative perspective. Based on a statistically representative sample (592 domain names), a qualitative interpretation allowed a more fine-grained analysis of how the new TLDN is being used in practice. By doing so, the article gives detailed insight into the impact of the recent changes to the rules concerning domain name registration. Through this analysis, researchers, policy makers, investors and anyone concerned about the identity of Brussels in the digital realm may have a better understanding of the state of play of the .brussels TLDN.

En 2012, la libéralisation du marché des noms de domaine de premier niveau a ouvert de nouvelles perspectives aux entreprises, aux administrations et aux particuliers, en leur permettant d’inclure un élément géographique dans le nom de domaine de leurs sites web. Depuis lors, très peu d’études, pour autant qu’il en existe, ont été menées sur l’utilisation des nouveaux noms de domaine de premier niveau (*top-level domain names*, TLDN). À partir du cas spécifique du TLDN « .brussels », le présent article propose une analyse empirique de l’impact réel de l’ouverture de ce marché sur les pratiques en matière d’enregistrement de noms de domaine. Au moyen de logiciels en accès gratuit, tels qu’OpenRefine, et de méthodes de traitement du langage naturel (TLN), l’ensemble des 6 300 noms de domaine finissant par « .brussels » a pu être examiné du point de vue quantitatif. L’interprétation qualitative d’un échantillon statistiquement représentatif (592 noms de domaine) a permis d’affiner l’analyse

pour voir comment ce nouveau TLDN est utilisé dans la pratique. Ainsi, l'article apporte des informations détaillées sur l'incidence des récentes modifications réglementaires relatives à l'enregistrement des noms de domaine. Voilà qui devrait éclairer chercheurs, décideurs, investisseurs et quiconque se souciant de l'identité de Bruxelles dans le monde numérique quant à la situation du TLDN « .brussels ».

De openstelling van de markt van de top level domeinnamen in 2012 bood nieuwe perspectieven voor bedrijven, overheden en privépersonen om een geografisch component op te nemen in de domeinnaam van hun website. Sindsdien werd er weinig tot geen onderzoek verricht om de introductie van de nieuwe top level domeinnamen (TLDN) te analyseren. Op basis van het specifieke geval van de TLDN .brussels, bespreekt dit artikel het empirisch onderzoek naar de mate waarin de openstelling van de markt van de top level domeinnamen de registratiepraktijken daadwerkelijk heeft beïnvloed. Door gebruik te maken van vrij beschikbare softwaretools, zoals OpenRefine en Natural Language Processing (NLP) methodes, werd het volledige corpus van de .brussels domeinnamen (6 300) vanuit kwantitatief oogpunt geanalyseerd. Op basis van een statistisch representatieve steekproef (592 domeinnamen), maakte een kwalitatieve interpretatie een verfijndere analyse mogelijk van de manier waarop de nieuwe TLDN in de praktijk wordt gebruikt. Op die manier geeft het artikel een gedetailleerd inzicht in de gevolgen van de recente wijzigingen van de regels inzake registratie van de domeinnamen. Dankzij deze analyse kunnen onderzoekers, beleidsmakers, investeerders en al wie om de identiteit van Brussel in de digitale wereld geeft, een beter inzicht krijgen van de stand van zaken van de .brussels TLDN.

INDEX

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