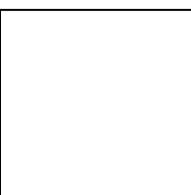


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Cybersecurity in the news

A grounded theory approach to better understand its emerging prominence

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Abstract. *Cybersecurity has become a popular topic in recent years in both media and international politics. In this article we address the question of whether we can pinpoint a specific point in time when cybersecurity started to become a topic of high interest? To answer this question we use a Grounded Theory approach. Quantitative analysis shows a clear peak in the use of the word cybersecurity in Google search terms in both United States as British national newspapers in 2009. This 2009 peak sparked our interest and further qualitative analysis was performed to gather more insights. From this analysis we conclude that the inauguration of United States president Obama is a main cause to the sudden rise in popularity of the word cybersecurity. We found that 62 out of 133 newspaper articles in 2009 cover the new cybersecurity strategy of the US.*

Keywords: grounded theory, daily news, cybersecurity

Introduction

Sometimes the news is dominated by particular topics for weeks or months. Many articles on the topic are published in a short period of time, creating the impression that a crisis is approaching and thus enlarging anxiety among the public (Vasterman, 2005). Large media coverage can have an enormous impact on for example a nation and the reinforcement of national identity (Brookes, 1999). Cybersecurity is a topic of high interest lately in international politics, scholars however do not explicitly investigate the topic (Kshetri, 2013). This article therefore aims to identify the starting point when cybersecurity started to become a topic of high interest.

Over time there are several examples of the popularity of cybersecurity. The Mandiant report in February 2013 on the suspicion of espionage by the Chinese government is one of these examples. Another corresponding example is the recent PRISM “scandal” regarding the global electronic surveillance by the United States National Security Agency. This latter topic has ground in common with the Mandiant report. Both topics cover espionage and the level of national cybersecurity, discussing the question: are we in danger? These two examples have gotten much attention in the media within a short period of time.

Our research started with the ‘feeling’ that cybersecurity has become a somewhat hyped topic. While starting with a feeling is usually not a solid basis for research, in this case it might be. The method (which is discussed in more depth in the next paragraph) applied here is Grounded Theory with the ‘feeling’ being the starting point. The main question addressed in this article is: “Is there a specific point in time when cybersecurity started to become an topic of high interest?”.

To answer this question we first looked at Google searches on the topic. In these data a peak was found. During further research we analyzed newspaper articles to gather more insights on this peak. But first, we will discuss the terms cybersecurity and media hypes.

Background

Before the question can be addressed the term cybersecurity itself is shortly discussed. What is cybersecurity, exactly? There is much literature that contains the word cybersecurity. It is difficult however to find definitions on this topic which are based on fundamental research. Some authors avoid discussing the term and its history by stating that they do not want to engage in a debate on semantics (Bayuk et al., 2012). Further on Bayuk *et al.* (2012, p. 3) do come up with their own definition “cyber security as a method of using people, process and technology to prevent, detect and recover from damage to confidentiality, integrity and availability of information in cyberspace”. Another author Kshetri (2013) in the field of cybersecurity uses the UN International Telecommunication Union definition (p. 6): “cybersecurity is the collection of tools, policies, security concepts, security safeguards, guidelines, risk management approaches, actions, training, best practices, assurance and technologies that can be used to protect the cyber environment and organization and user’s assets”. Cybersecurity is often linked with the three terms: confidentiality, integrity and availability (Bayuk et al., 2012; Graham, Howard, & Olson, 2010; Kshetri, 2013).

Next, we give some background on the characteristics of a (media-)hype. According to Vasterman (2005) a media-hype covers amplification and magnification of a specific topic in the news; enlarging it and evoking social responses which further stimulates the news wave. News media can play an important role as it comes to amplification of a risk message, for example the sensational headlines of the Chernobyl nuclear disaster increased the perceived catastrophic potential of nuclear power (Kasperson et al., 1988). Another example of amplification is the news papers that keep ‘excitement alive’ by writing different types of reports after actual triggering incidents are tailed off (Cohen, 2002). During this research we will zoom in on newspaper articles and see whether articles hype the topic of cybersecurity.

Method

In this research we derive theory from data and therefore we applied grounded theory as a research method (Glaser & Strauss, 1967). Because of the use of this method the research had an explorative character, changing with every new finding or ‘piece of evidence’. The starting point of our research was the assumption (or feeling) that there ‘must be’ a tipping point in time when cybersecurity started to become very popular. From that assumption the

search journey started with a look at search engines and the number of searches for specific words (cybersecurity, cyber security and the prefix cyber).

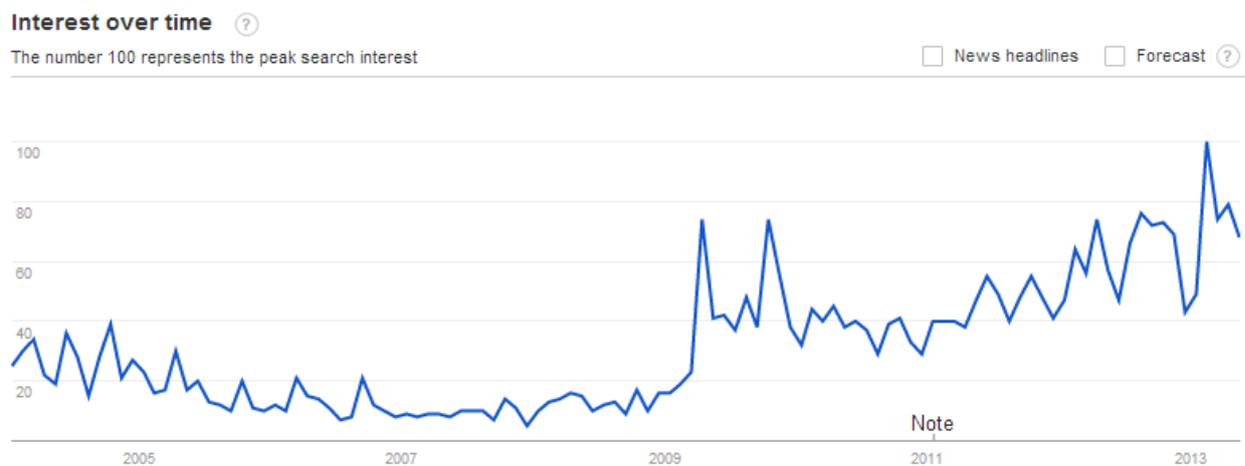
This approach was extrapolated to newspaper articles: the number of articles covering different terms over time, from 2000 till 2012. Data was derived from the Lexis Nexis Academic database, a large database containing full text versions of newspapers worldwide from the early nineties up to today. In this database national newspapers of the United States and the United Kingdom found. On these data a quantitative and qualitative analysis were performed. The quantitative data were analyzed with a spreadsheet application. For the qualitative analysis the NVivo software was used.

Findings

As discussed previously the research started with the feeling of a hype and two examples with large media coverage. Can we find evidence for a hype? Our first data source for analysis was the Google “Interest over time” graph.

Google peak in 2009

The Google Interest over time graph represents the relative number of searches on a specific term(0 = no interest and 100 = highest interest).



Figuur 1 - Google searches on cyber security

When looking for the term cybersecurity, the graph shows that there have been some peaks from 2004 to 2006 that go to a maximum of 40. From 2007 to 2009 the line stays somewhere between 10 and 20. In 2009 there is a enormous increase towards 75. After this the search peak interest drops, peaks again, and keeps increasing till half 2013. The sudden increase in 2009 sparked our interest. What is the explanation of this peak? Is this peak also visible in the media? Is there a media-hype connected with this dramatic increase of interest? Our next step was to look at newspaper articles.

Articles in newspapers show same peak

The trend that is visible in the Google Interest over time graph is also visible in newspaper articles. In Lexis Nexis we searched for articles containing “cybersecurity”, “cyber security” and the prefix “cyber” in national newspapers of the United States and United Kingdom.

Table 2 (on page 5) shows the all the results of the searches from 2000 till 2012. One of the first observations is the drop of the use of the prefix cyber from 2000 till 2005. Although this is very interesting we will not discuss it here because it is out of scope of this research. Something we will discuss is the peak from 2009 in the use of the prefix cyber and the words cybersecurity/cyber security in the United States and United Kingdom: where in 2008 in the USA the word is only used 27 times in 2009 this peaks to 155 (4,7 times more than 2008). In the UK the use of the word goes from 5 to 59 (10,8 times more). In Figuur 2 and Figuur 3 the tipping points are clearly visible from which the use of the terms increases dramatically. What is the trigger for this dramatic increase, can we find an explanation?

Explanations for the peak in 2009

To answer this question, we extracted the 155 articles from US national newspapers of the year 2009 that contained the word cybersecurity. On these articles a qualitative analysis was performed using the qualitative data analysis software NVivo. 133 articles remained after a first selection. The 22 articles that were excluded, are either duplicates or incorrect in the dataset.

On the remaining articles a word count was used to gather information on the topics discussed in the articles. The results are presented in table 1. In the table we see ten words: security, 2009, new, government, obama, cybersecurity, national, president, computer and military. Observing the ranking we see that cybersecurity is on the “sixth place” and secondly that the words “government” and “obama” are counted very often (together with “national” and “president”). Based on these observations one could say that there is something new going on with the government, president Obama and cybersecurity in 2009.

Rank	Word	Length	Count
1	security	8	698
2	2009	4	483
3	new	3	462
4	government	10	427
5	obama	5	387
6	cybersecurity	13	383
7	national	8	378
8	president	9	289
9	computer	8	286
10	military	8	286

Table 1 - Word count performed by NVivo

Search terms	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Cybersecurity (USA)	25	36	69	104	85	59	70	21	27	155	193	315	589
Cyber security (UK)	8	1	9	8	8	11	6	7	5	59	145	309	478
Prefix cyber (USA)	6078	3888	2859	2731	2301	2172	2415	2134	1888	1898	2205	2800	3414
Prefix cyber (UK)	3742	2303	1520	1373	1254	1416	1941	2161	1861	2548	3203	4007	5767

Table 2 - Articles containing terms cybersecurity, cyber security and prefix cyber

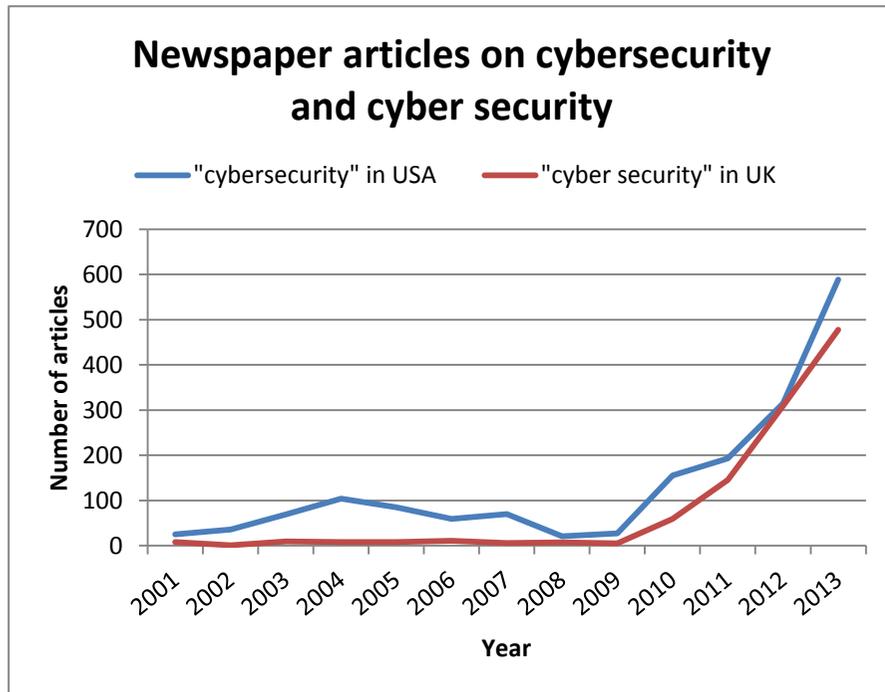


Figure 2 - Articles containing the terms cybersecurity and cyber security

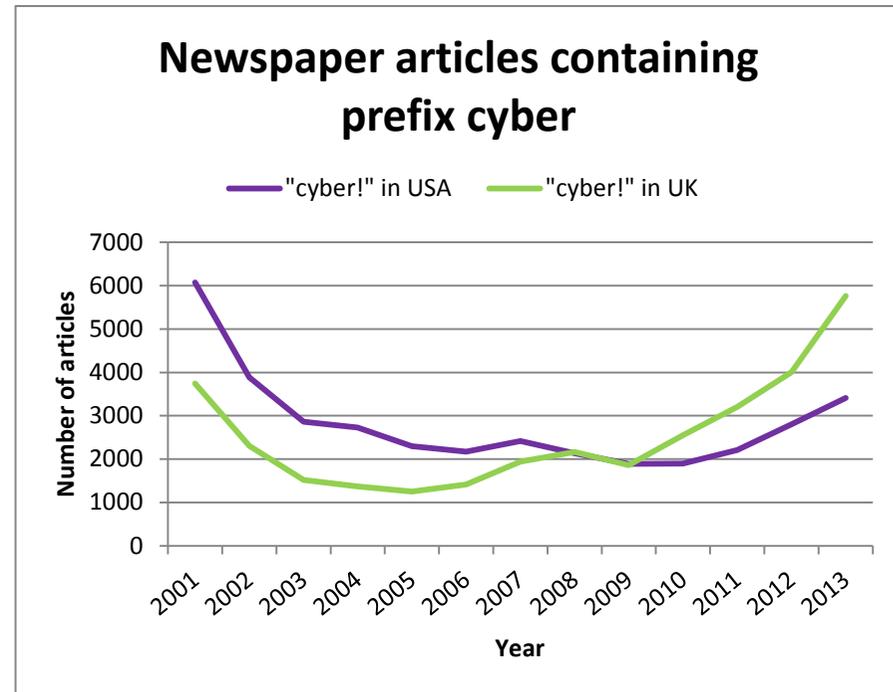


Figure 3 - Articles containing the prefix cyber

A further detailed research on the articles revealed that of the 133 articles no less than 62 articles cover the new (to be formed) cybersecurity strategy of Obama. In the beginning of 2009 Obama launched a so called “60-day review” of the US national cybersecurity strategy. Based on this review a new cybersecurity strategy was formed and a cybersecurity “czar”/coordinator was installed in the White House.

43 other articles only mention the word cybersecurity as either an example or as a side topic: “New NSC directorates will deal with such department-spanning 21st-century issues as *cybersecurity*, energy, climate change, nation-building and infrastructure” (The Washington Post, 8 February 2009). Or The New York Times on 27 february 2009: “style weapons systems to smaller programs focused on fighting insurgents in Iraq and Afghanistan and new threats to the nation's cybersecurity.” The articles often talk about a new threat.

Furthermore 8 articles discuss an incident, for example an incident on 9 July between North and South Korea. “The South Korean authorities issued a cybersecurity warning on Wednesday after the Web sites of several major government agencies and financial institutions were disabled, apparently by hackers” (The New York Times, 8 July 2009). 4 articles covered cybersecurity and privacy, and 12 articles were placed in the category other. This category contains articles that discussed cybersecurity in different context, such as education, research, or commercial initiatives.

Discussion

During this research we found that in 2009 cybersecurity has become a topic of high interest. This was visible in Google searches and the number of newspaper articles containing the term cybersecurity. During the qualitative analysis of the newspapers an explanation was found for this peak in 2009. US president Obama’s called for a review of the nation’s cybersecurity strategy in 2009. This review and the forming of a new strategy resulted in increased media attention. Why did Obama call for this review? He was inaugurated as president on January 20 2009 as the successor of Republican president G.W. Bush. The review of the strategy does not come as a surprise, because of the differences between the Democratic and Republican approach on security. Based on these findings we state that the inauguration of Obama in 2009 made the cybersecurity a topic of high interest.

It is possible that the news media played a role in the amplification of the (cybersecurity) risk message (Kaspersen et al., 1988). It was often mentioned as a “new threat” or “21st-century issue”. Unfortunately we were only able to qualitatively analyze the national newspapers of the United States. In future research it would be very interesting to have a closer look at the articles in British national newspapers and other countries.

For now we have found one of the explanations of the high interest for cybersecurity. There is however much more visible within the data that requires more research. Examples are the ever increasing interest in cybersecurity after 2009 and the drop of the use of the prefix cyber from 2000. These examples did not fit within the scope of this current research. More research should be performed to get a clearer understanding of the popularity of cybersecurity.

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