The Online Development of the Ministry of Defence (MoD) and Armed Forces

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This project used the material in the UK Web Archive to explore the online development of the Ministry of Defence (MoD) and Armed Forces between 1996 and 2013, from the perspective of its ambition and functions, and how these changed over time. The extent to which the online content and design of the MoD and Armed Forces websites had been shaped by recruitment was an area of particular interest. The integration of multimedia content, social media and blogs into the Armed Forces websites was also identified as an area of significance. Between 1996 and 2013 the .mod.uk domain comprised a significant number of websites, as well as the main websites of the MoD and Armed forces. The Territorial Army (TA) possessed a separate website for part of this period while many of the .mod.uk websites were run by MoD agencies: arms-length bodies of the MoD. Link analysis was used to attempt to determine the separate development of these websites and how connected they had been with other websites in the .mod.uk domain.

Methodology

A corpus of material was created by selecting five iterations of the websites of the MoD, British Army, Royal Navy and RAF, based on their proximity to a shared predefined date. These iterations were analysed to a navigational depth three levels below the homepage; the homepage was determined to be the main page of a website, and splash pages were not considered as a level of navigational depth. The websites were selected by organization rather than URL, as in the case of the Royal Navy and MoD websites the primary URL changed during the course of this period. In each instance all content on a page, including navigational elements, was subjected to thematic and contextual analysis using thematic coding and comparisons to advances in internet design and online capabilities. Having undertaken this initial analysis, specific search terms and parameters were designed to query the UK Web Archive to identify whether trends on various iterations of a website, or page, were reflected across the .mod.uk domain. Further queries for the UK Web Archive were created based on information collected from material relating to Armed Forces recruitment during this period.

Several approaches were taken to value content on a webpage. The content analysed in this study was primarily written material, videos, images and navigational elements; data such as metatags and code was studied when the initial analysis of a site suggested the need for further exploration. Navigational elements are an important source of information about the priorities of a site but are difficult to evaluate. Similarly, the location of content on a page is important to understanding that content's purpose, and needs to be considered. This study has drawn upon the web design and usability concept of prominence within

visual hierarchy design, the visual layering of information which helps the user to focus on context and priority to value the importance of each aspect of a page being analysed.[1] Content which occurs below the fold of a webpage, the part of the webpage that cannot be seen without scrolling down, poses a challenge to assessing its importance; visual hierarchy design suggests such content will be of a lower order of importance. However, as web design for mobile users began to shape web pages towards the end of this period there was an increase in content moving below the fold. This study has considered content above the fold, visible without further action, to be most important to the purpose of the webpage, with content below assessed according to context as well as position.[2]

Websites within the initial corpus, and material, webpages and websites subsequently generated, were subjected to content, thematic and contextual analysis. Thematic coding, the categorization of content by theme, was used to quantitatively analyse websites and explore how much of their content was dedicated to a particular purpose. Thematic coding also enabled visualization of a webpage's priority. In the case of the British Army, this revealed a primary focus on recruitment but also a secondary focus on serving soldiers, categorized as retention; while the MoD site showed a focus on publishing information and news stories involving the MoD.

Contextual analysis considered a variety of aspects about individual webpages. The style and design of the website was considered against other sites of the period to see if there was an attempt to establish a shared identity or image across the .mod.uk domain. The target audience of a website was then assessed to see whether individual features were aimed at particular users in different ways and whether this changed over the course of the period. The reaction that unique content is intended to evoke from users, and indeed whether there was any intention to prompt a certain action from users, was also considered. Such analysis revealed that the British Army pages on training were geared towards moving users through to recruitment pages. As part of this analysis, changes in the internet across this period, and how those changes have been reflected on an individual site, were considered. In particular the incorporation of video, blog and social media content was assessed to determine whether the use of these elements occurred across the website or in particular areas, such as the recruitment section. This period also corresponds to the significant development of the internet both as a resource to disseminate information and in the audience which can now be reached (in 2013 76 million people in Britain accessed the internet every day and 83 per cent of British households had internet access, as opposed to 9 per cent of UK households in 1998).[3] Changes in the way users interact with websites have

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[1] S. Krug, *Don't Make Me Think Revisited* (Thousand Oaks, Calif., 2014), p. 34; S. Watzman, 'Visual design principles for usable interfaces', in *The Human Computer Interaction Handbook*, ed. J. A. Jacko and A. Sears (Mahwah, N.J., 2002), p. 283.

[2] J. Nielson, Scrolling and Attention: Nielsen Norman Group http://www.nngroup.com/articles/scrolling-and-attention/ [accessed 21 Jan. 2015].

[3] Key Points, Internet Access – Households and Individuals, 2013: Office for National Statistics http://www.ons.gov.uk/ons/rel/rdit2/internet-access---households-and-individuals/2013/stb-ia-2013.html

also been considered. At the start of this period users were likely to enter a site via the homepage and needed help navigating to the area of the site they were seeking. With the advancement of search engines users were subsequently more likely to enter the site at the point they wanted and then navigate backwards to the homepage.

The analysis of websites in the corpus raised methodological concerns. Material from fragmented sites was difficult to evaluate and raised the question of whether incomplete captures should be disregarded and the nearest complete site iteration used instead. The analysis of websites in the initial corpus used complete captures if they had unchanged content, determined by inspecting the underlying code; otherwise the incomplete iteration was used. Incomplete captures can have significant value; often yielding data from remaining coded elements or in descriptions and annotations applied to content, particularly navigational elements or images (see Figure 1). Captures of sites which record only an error message or a holding page because the site is down can also yield data: in the case of the British Army one capture point resulted in a message which stated the army site was not available but that recruitment information could be found at alternative locations.[4] This information was highly relevant and was recorded, but an alternative iteration of the site was chosen for the corpus because its purpose was to analyse in depth.
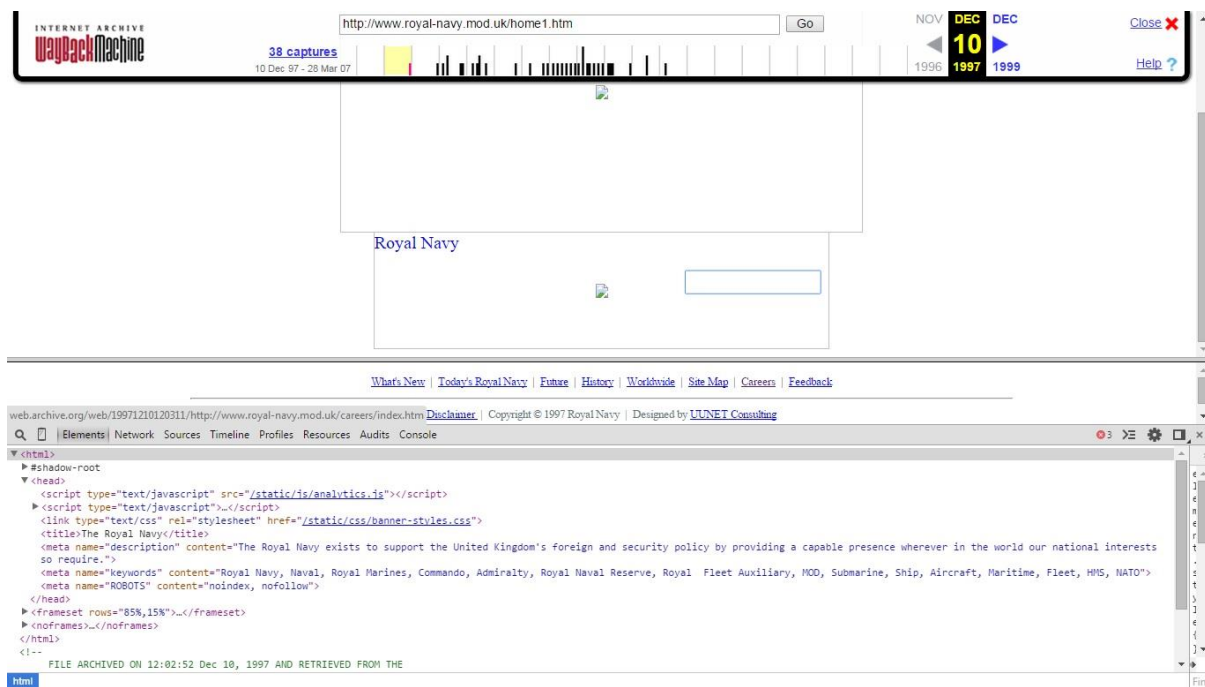
[accessed 21 Jan. 2015]; Household Internet Access, Internet Access – Households and Individuals, 2013: Office for National Statistics http://www.ons.gov.uk/ons/rel/rdit2/internet-access---households-and-individuals/2013/stb-ia-2013.html#tab-Household-Internet-access [accessed 21 Jan. 2015].
[4] Site Down Holding Message: British Army http://web.archive.org/web/20000510122305/http://www.army.mod.uk/ [Internet Archive, site captured 10 May 2000].

Figure 1 – An incomplete capture of the Royal Navy homepage and the Google console below displaying various elements; despite initial appearance the remaining elements are highly valuable.[5]

The findings of the corpus analysis are structured to deal with the MoD, then the British Army and subsequently the Royal Navy and RAF. As will be discussed below, the MoD's development has had very separate traits to those of the Armed Forces. Aspects of the British Army's website are considered separately to those of the Royal Navy and RAF. While the Royal Navy and RAF's websites have shared similar traits the British Army's online development possessed unique features which benefit from individual consideration. Link analysis and visualization were undertaken to identify trends occurring in the .mod.uk domain across this date range. The objective of this research was to identify how effective sites across the .mod.uk domain had been in establishing their presence online and whether particular organizations were linking to the .mod.uk domain. Corpus analysis was used to target areas of particular interest within the larger .mod.uk link data; the link analysis undertaken on the Territorial Army (TA) and the educational establishments of the British Army are discussed in this paper. The trends observed within link analysis formed the basis of further queries within the UK Web Archive to test whether these trends were confirmed or invalidated by the material generated.

In conducting link analysis several limitations must be considered. The number of instances of a link within the data refers not to the total number of links found but to the instances of pages upon which links occur; therefore if a webpage or other material had several links they will only appear as one instance. Furthermore, instances only refer to active links: dormant links, where the content of a webpage or material with a link has not changed in the period between captures, will not appear in the data due to the manner in which the results were deduplicated. If a webpage was not captured in a particular year its links will also be absent from the data for that year and if a website or page was not captured at all then there will be no record of a link. The link data from the UK Web Archive host level link graph, 1996–2010, records only the captured links in the UK webspace. Websites on domains outside of the UK webspace are absent, meaning only a partial picture is available. Therefore, inferences from the data have to reflect this factor. A further limitation of link analysis is that it only shows that there was a link: it does not show how that link was being used and so there is no way to determine if a page was hosting a prominent link in its text content or if the results in the data are due to a site-wide footer link. Conclusions based on link analysis have to be tempered by these factors. The statistical results produced through link analysis were informative but the underlying data also provided a basis for further qualitative research within the UK Web Archive; notably, as will be discussed in the results section, this identified the Defence Academy's use of both the .ac.uk and .mod.uk domains.

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[5] Homepage: Royal Navy http://web.archive.org/web/19971210120252/http://www.royal-navy.mod.uk/ [Internet Archive, site captured 10 Dec. 1997].

The .mod.uk link data was extracted from the UK Web Archive host level link graph, 1996–2010.[6] Having extracted the data it was visualized as a network through the use of Gephi, a network analysis and visualization tool, utilizing the Fruchterman-Reingold algorithm, a force-directed layout algorithm, and the ForceAtlas2 algorithm, a force vector algorithm used to enhance visualization. The results of this visualization were used to detect features within the link network and identify trends. The link data for the TA website, ta.mod.uk, was visualized separately with Gource, a project development visualization tool. However, while the visualizations produced with Gource were useful for identifying links which were active year on year, it provided little insight which could not be gained from the basic link analysis data. The process for visualizing links which changed direction also proved complicated.

The results of the link analysis focus on four subjects. The position of the MoD agency Supporting Britain's Reservists and Employers (SaBRE) within the visualization of the .mod.uk link data is presented and discussed. An anomaly in the number of.ac.uk links in the .mod.uk domain link data emerged; this anomaly and the reasons for it are discussed. The educational establishments of the British Army and the frequency of links to their website from the British Army website were considered in the light of an apparent decline in prominence on the latter. Finally the link analysis of the TA is discussed.

Findings

Content analysis and thematic coding of the MoD website revealed a predominant focus on the latest defence news, current operations and the provision of publications and reports throughout this period. Information on British defence policy was held on the MoD website but was not prominently presented on the homepage except in the circumstances of an active military commitment abroad.[7] Documents released by the MoD to a freedom of information request show that the MoD initially envisaged that 'An MoD website should be exploited as a tool for placing information in the public domain and for enhancing the public perception of Defence'.[8] Despite migrating to the .gov.uk domain in December 2012, resulting in the MoD website conforming to a particular layout, the MoD has been consistent in its use of its online resources to promote a positive 'corporate image'.[9] News and publications have remained the most prominent content on the MoD website throughout this period while discussion of British defence policy and capabilities has

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[6] Host Level Link Graph, Jisc UK Web Domain Data Set (1996–2010)
http://data.webarchive.org.uk/opendata/ukwa.ds.2/host-linkage/ (DOI: 10.5259/ukwa.ds.2/host.linkage/10 [accessed 20 Nov. 2014].
[7] Homepage: MoD http://web.archive.org/web/19990427013905/http://www.mod.uk/ [Internet Archive, site captured 24 Apr. 1999].
[8] DOMD to DGICS and DGMO, 28 Feb. 1997, attached draft paper 'MoD's use of the internet' https://www.whatdotheyknow.com/request/229360/response/603132/attach/7/28%20February%201997.pdf [accessed 20 Jan. 2015].
[9] OMD/AD (Information) to DGICS et al., 8 July 1996, annex 'Existing use of the internet' https://www.whatdotheyknow.com/request/229360/response/603132/attach/3/8%20July%201996.pdf [accessed 20 Jan. 2015].

become more substantial in controversial areas (such as the British nuclear deterrent) since the website migrated to the .gov.uk domain. By comparison, recruitment played a minor role in the online content of the MoD website throughout this period. The recruitment content which existed filtered users to either an Armed Forces recruitment page or the MoD civil service jobs website.

Before migrating to the .gov.uk domain the MoD website was primarily a portal to the websites of the Armed Forces and the content for various MoD agencies and support organizations. The agencies of the MoD represented a considerable source of content on the mod.uk domain. Using the UK Web Archive it was possible to track their online development. The location of many of the MoD agencies has varied between 1996 and 2013; many occupied a place on the MoD website at the start of this period, had migrated to their own websites by the early 2000s and were returned to the MoD website on the .gov.uk domain by 2013. By feeding observations from the corpus analysis into the process of search term construction, the close relationship of the MoD agencies, trading funds and arm's length bodies with the defence industry emerged as a significant factor in many instances. The MoD consistently used its website to provide online support, advice and guidance to defence suppliers during this period.[10] The visibility of content for business has decreased on the MoD's homepage over the same timeframe, falling from a high position in the top-level navigation and main content section to a lower position in the main content and requiring two levels of orienteering via the top-level navigation.[11]

Analysis of the British Army website showed that it was heavily focused on recruitment throughout this period. Recruitment content was highly prominent in all iterations of the homepage viewed in the archive, and navigational elements to the recruitment section were prominent across the website. Content ostensibly covering one area was frequently designed to push users towards the recruitment section of the website; this is particularly true in the case of the information on training. In addition, the British Army website's focus on recruitment is indicated by the holding message, displayed on 10 May 2000 when the army.mod.uk site was unavailable, that advised users seeking information on recruitment where alternative sources of information could be found.[12]

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[10] Introduction to the MoD Procurement Portal: MoD Contracts http://web.archive.org/web/20040207050046/http://www.contracts.mod.uk/ [Internet Archive, site captured 7 Feb. 2004].

[11] Doing Business with the MoD: MoD http://web.archive.org/web/19980701110216/http://www.mod.uk/commercial/commercial.htm [Internet Archive, site captured 1 July 1998]; Homepage: MoD http://web.archive.org/web/20060801103709/http://www.mod.uk/defenceinternet/home [Internet Archive, site captured 1 Aug. 2006]; Defence For: MoD http://web.archive.org/web/20120908150543/http://www.mod.uk/DefenceInternet/DefenceFor [Internet Archive, site captured 8 Sep. 2012].

[12] Site Down Holding Message: British Army http://web.archive.org/web/20000510122305/http://www.army.mod.uk/ [Internet Archive, site captured 10 May 2000].

There was also a prominent focus on serving soldiers, soldier welfare and information for families on the British Army website at the beginning of this period. However, this focus decreased significantly as a result of the 2008 redesign of the British Army website. Searches within the UK Web Archive identified that a considerable proportion of the army.mod.uk site's depth and resources were dedicated to information and activities for serving soldiers, as well as subjects that could be classified as aiding personnel retention. Evidence located in the UK Web Archive revealed that information on activities was also used as a tool for encouraging recruitment.[13] However, much of the deep-level content of the British Army website in the first half of this period is aimed at serving soldiers.[14] As the period progresses detailed content for serving soldiers is progressively moved to armynet.mod.uk and subsequently to the restricted access information portal defencegateway.mod.uk.[15]

The terminology for recruitment used by the British Army changes dramatically during the course of this period. In the early years one of the most frequently occurring words on the British Army homepage was 'career': recruitment links were labelled as 'careers' and the main recruitment page had the URL army.mod.uk/careers. By 2012 'career' did not appear once in the content of the British Army homepage and while a link to the Online Careers Office remained, the URL for the recruitment page became army.mod.uk/join.[16] Data from the UK Web Archive (see Figure 2) supported the observation that the use of the word 'career' was supplanted by 'joining' in 2007: from 2008 there were only a minimal number of captured instances of the word 'career' occurring outside proximity to 'joining' in the content of the British Army website. Certain individual corps and regiments maintained the use of 'career' after 2008. In the case of the Royal Engineers there are not only frequent references to the idea of a career in the engineers but the opportunity to gain meaningful qualifications is stressed. Instances of individual corps or regiments maintaining the use of the word 'career' over 'joining' are usually – but not always – more frequent if they require high technical skill levels. Notably, the Infantry section of the British Army website replaces

[13] The Prince of Wale's Royal Regiment, Sport and Adventure Training: British Army http://web.archive.org/web/19991117065435/http://www.army.mod.uk:80/army/organise/infan/pwrr/sport.htm [Internet Archive, site captured 17 Nov. 1999].
[14] Army Sub-Aqua Diving Association: British Army http://web.archive.org/web/20060227090429/http://www.army.mod.uk/sportandadventure/clubs/asada/index.htm [Internet Archive, site captured 27 Feb. 2006]; 'Sandy Times', 26, 12 March 2003, British Army http://web.archive.org/web/20030731070700/http://www.army.mod.uk/linked_files/ag/soldierwelfare/supportagencies/aws/pdf/sandy%20times%20Mar%2003.pdf [Internet Archive, site captured 31 July 2003].
[15] Homepage: ArmyNet Open http://web.archive.org/web/20090227150632/http://www2.armynet.mod.uk/ [Internet Archive, site captured 27 Feb. 2002]; Site Closure Message: ArmyNet Open http://web.archive.org/web/20120415084651/http://www2.armynet.mod.uk/ [Internet Archive, site captured 15 Apr. 2012].
[16] Homepage: British Army http://web.archive.org/web/20120804124656/http://www.army.mod.uk/ [Internet Archive, site captured 4 Aug. 2012]; Joining the Army: British Army http://web.archive.org/web/20120804124701/http://www.army.mod.uk/join/join.aspx [Internet Archive, site captured 4 Aug. 2012].

the use of 'career' with 'joining' and none of the eighteen infantry regiments in the section uses 'career' in the section navigation.[17]
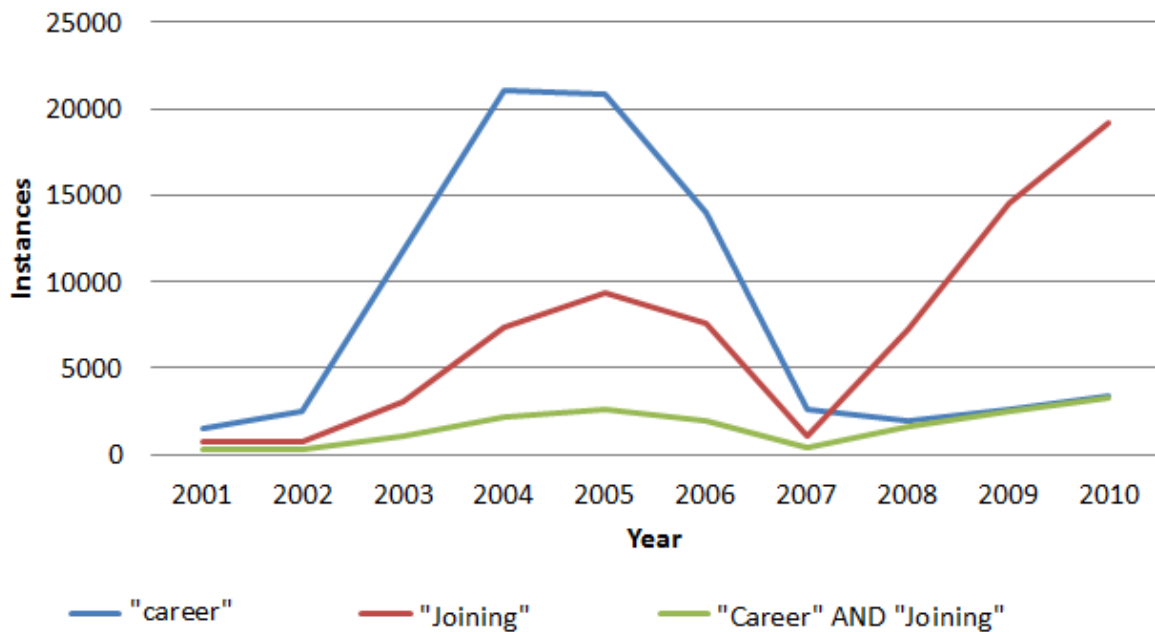

Figure 2 – UK Web Archive results for recruitment terminology on army.mod.uk.

The British Army's focus on recruitment, and the change in terminology which occurred during this period, is reflected in the 2006 closure of the TA website. The British Army's responsibilities for recruitment increased during this period as a result of the 'One Army' recruitment policy, which gave the Army responsibility for regular and reserve recruitment. This change resulted in the closure of the ta.mod.uk website, with an HTTP 302 URL redirection posted to automatically transfer users to armyjobs.mod.uk/territorialarmy/.[18] The HTTP 302 alters over the years: in 2007 the redirect has changed to the armyjobs.mod.uk homepage and by 2011 users were redirected to the 'joining the army' webpage on the British Army website.[19] As the HTTP 302 redirect changed during this period the prominence of TA content decreased on the webpage linked to and within the Army recruitment website.

The number of navigational elements to the recruitment section from the British Army homepage decreased midway through the study period. However, the prominence of the remaining links to the recruitment section did not decrease and content on the British Army

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[17] Infantry Regiments: British Army
http://web.archive.org/web/20130504105703/http://www.army.mod.uk/infantry/23299.aspx [Internet Archive, site captured 4 May 2013].
[18] http 302 redirect: TA http://web.archive.org/web/20060813123233/http://www.ta.mod.uk/ [Internet Archive, site captured 13 Aug 2006].
[19] http 302 redirect: TA http://web.archive.org/web/20070703071729/http://www.ta.mod.uk/ [Internet Archive, site captured 3 Jul. 2007]; http 302 redirect: TA
http://web.archive.org/web/20110827233503/http://www.ta.mod.uk/ [Internet Archive, site captured 27 Aug. 2011].

homepage remained highly focused on recruitment. The importance of recruitment content on the British Army website did not decrease at this point: thematic analysis and visualization confirmed that recruitment content was as important as before the reduction in links (see Figure 3), and similar changes in link deduplication were observed across the .mod.uk domain. The redesign of the British Army site in 2008 resulted in a reduction in the prominence of the recruitment section in the top navigation; the prominence and quantity of recruitment content on the homepage also decreased.[20] These changes were partially revoked at the end of 2013, with an increase in the prominence of recruitment in the top navigation.[21] Recruitment content became more prominent in 2009 than was originally the case after the 2008 redesign. Iterations of the Army homepage captured at the beginning of 2014 show an increase in recruitment content; this content was also positioned prominently to occupy the above-the-fold web real estate, where users spend the majority of their time on a website.[22] Using the UK Web Archive it was possible to confirm that the developers of the British Army website were aware of user trends in navigation, prominence and scanning; in 2004 British Army Webmasters posted links for Army Content Management System users which advised of these trends.[23]

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[20] Homepage: British Army http://web.archive.org/web/20081216062401/http://www.army.mod.uk/ [Internet Archive, site captured 16 Dec. 2008].

[21] Homepage: British Army http://web.archive.org/web/20131102151630/http://www.army.mod.uk/ [Internet Archive, site captured 2 Nov. 2013].

[22] Homepage: British Army http://web.archive.org/web/20140214123742/http://www.army.mod.uk/ [Internet Archive, site captured 14. Feb. 2014].

[23] Web Site Design: W3Schools http://web.archive.org/web/20041013060854/http://www.w3schools.com/site/site_design.asp [Internet Archive, site captured 13 Oct. 2004]; Resources: Army Content Management System http://web.archive.org/web/20040927102638/http://www.army.mod.uk/editors_page/resources.htm [Internet Archive, site captured 27 Sept. 2004].
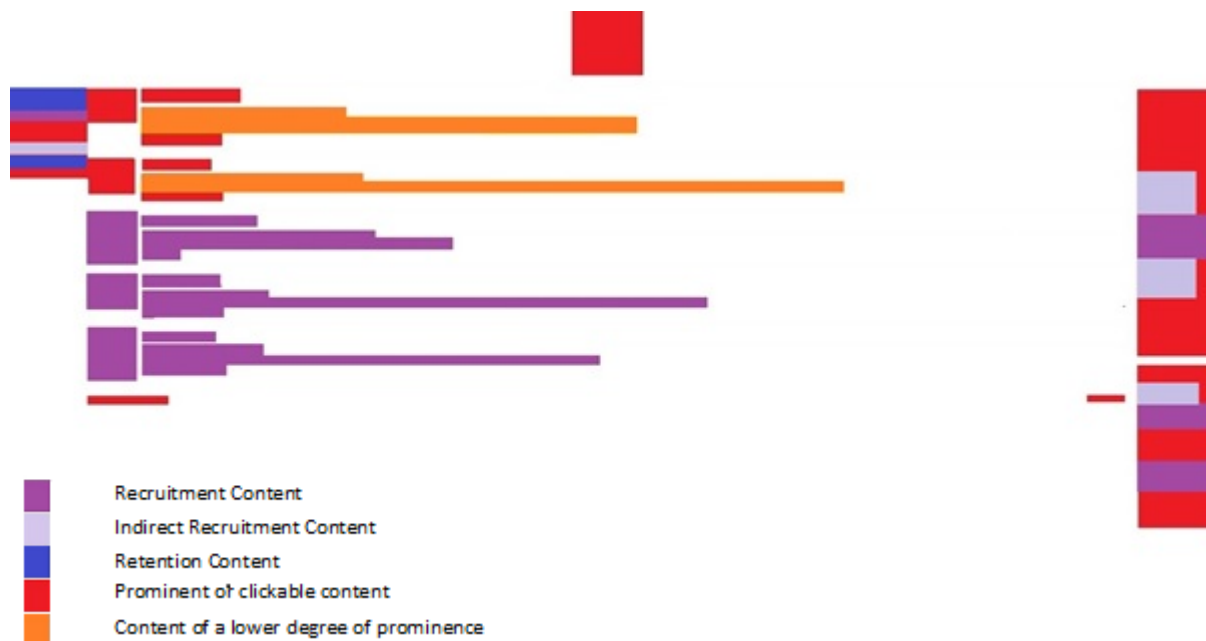
Recruitment Content
Indirect Recruitment Content
Retention Content
Prominent or clickable content
Content of a lower degree of prominence

Figure 3 – 15 Aug. 2000 British Army homepage thematically coded for recruitment and retention.[24]

The Armed Forces increasingly integrated their websites into their overall recruitment strategies during this period. In 1998 the British Army website launched a new Army Medical Services section to support a television and press advertising campaign.[25] In 2008 the Royal Navy carried out specific advertising campaigns for recruitment in a number of shortage categories, including Air Engineering Technicians. The Royal Navy website reflected this campaign with an Air Engineering Technician prominent on the Royal Navy main careers page and an engineering officer 'in the spotlight' of the careers role page.[26] Analysis of traffic on the Royal Navy Careers website showed an increase of 96 per cent for the Air Engineering Technician pages between July and August 2008.[27] Reflecting changing technology and the advance of the internet as a whole, the Royal Navy website increasingly integrated multimedia elements within its content. By June 2012 the Royal Navy homepage incorporated six unique video elements; of those elements five were related to individual

[24] Homepage: British Army http://web.archive.org/web/20000815195949/http://www.army.mod.uk/ [Internet Archive, site captured 15 Aug. 2000].

[25] Homepage: British Army http://web.archive.org/web/19990427041518/http://www.army.mod.uk/army/index2.htm [Internet Archive, site captured 27 Apr. 1999].

[26] Homepage: Royal Navy Careers http://web.archive.org/web/20070809134554/http://www.careers.royalnavy.mod.uk/index.php [Internet Archive, site captured 09 Aug. 2007]; Careers/Roles: Royal Navy Careers http://web.archive.org/web/20070709050524/http://www.careers.royalnavy.mod.uk/careers/index.php [Internet Archive, site captured 9 July 2007].

[27] House of Commons Defence Committee, *Recruiting and Retaining Armed Forces Personnel: Government Response to the Committee's Fourteenth Report of Session 2007–08*, Eleventh Special Report of Session 2007–8, HC1074, 3 Nov. 2008.

force components in the Royal Navy while the last was for the Royal Navy careers page.[28] The Royal Navy also created a multimedia section on its website aiming 'to provide visitors with an insight into the range of activities on which the Royal Navy is involved. The images, video and interactive features demonstrate the range of environments the Royal Navy operates, extending from training through to frontline working conditions'.[29] The Royal Marines official YouTube channel is also prominent in the 15 June iteration of the Royal Navy homepage, as are links to follow the Royal Navy on Facebook. The 8 August 2012 iteration of the RAF homepage had a prominent link for its social media channel but no video content; a trend reflected across the RAF website, which had minimal video content throughout this period.[30] An exception to this lack of interactive and video content occurs in the RAF recruitment pages – an RAF advert is prominently positioned on the main recruitment page while interactive elements and further video content have been partially captured in the recruitment sections below this.[31] In 2011 the RAF recruitment section also integrated a Twitter feed into its content.[32] The British Army site sits at a midway point between these extremes of interactive and multimedia content; the video content of the British army was predominantly located within recruitment sections for much of this period. The 'Start Think Soldier' recruitment campaign of 2009 led to an increase in interactive elements and online digital games on the British Army website. The end of this period, and the 2008 redesign, led to video content in the equipment section, the style and content of which had a 'pumped-up' action movie feel, targeted to excite rather than inform. Video content within the corps and regiments section was also targeted at prospective recruits.[33]

The RAF website provided more prominent blog content than the Royal Navy website, a development which occurred towards the end of this period.[34] The Royal Navy did not prioritize the featuring of blog content, which disappeared from its websites at intervals.

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[28] Homepage: Royal Navy http://web.archive.org/web/20120615042111/http://www.royalnavy.mod.uk/ [Internet Archive, site captured 15 Jun. 2012].
[29] Multimedia Centre: Royal Navy http://web.archive.org/web/20090328133942/http://www.royalnavy.mod.uk/multimedia-centre/ [Internet Archive, site captured 28 March 2009].
[30] Homepage: RAF http://web.archive.org/web/20120808121953/http://www.raf.mod.uk/ [Internet Archive, site captured 8 Aug. 2012].
[31] Careers: RAF http://web.archive.org/web/20080513153229/http://www.raf.mod.uk/careers/ [Internet Archive, site captured 13 May 2008]; Careers, Jobs: RAF http://web.archive.org/web/20080513153234/http://www.raf.mod.uk/careers/jobs/ [Internet Archive, site captured 13 May 2008]; Careers, Is the RAF for Me?: RAF http://web.archive.org/web/20080607174406/http://www.raf.mod.uk/careers/istherafforme/ [Internet Archive, site captured 7 Jun. 2008].
[32] Careers: RAF http://web.archive.org/web/20110606044007/http://www.raf.mod.uk/careers/ [Internet Archive, site captured 6 Jun. 2011].
[33] Infantry Regiments, Scots Guards: British Army http://web.archive.org/web/20130326213237/http://www.army.mod.uk/infantry/regiments/23989.aspx [Internet Archive, site captured 26 March 2013].
[34] RAF Blogs from Afghanistan: RAF http://web.archive.org/web/20100718114221/http://www.raf.mod.uk/news/rafblogsfromafghanistan.cfm [Internet Archive, site captured 18 July 2010].

The Armed Forces blogs are primarily focused on either recruitment or the experience of personnel on operations.[35] During this time the Royal Navy blog moved from the URL royalnavy.mod.uk/jackspeak to royalnavy.wordpress.com.[36] A subsequent Royal Navy blog, on the experiences of HMS Somerset, was located to the Tumblr.com website. The British Army blog was also relocated; content which could be classified as a blog was found on the British army website in 1999 but by the end of this period the British Army blog had moved to a Wordpress.com domain address.[37] The Wordpress.com blogs are not captured in the UK Web Archive but the subjects being discussed in the individual blog entries are often derivable from the brief descriptions on link pages found within the archive. The nature of the Armed Forces blogs does not alter during this period but the change of location of these blogs is a conscious decision. The target audience for the British Army recruitment blogs also changes. At the start and end of this period the British Army recruitment blogs are on the experience of training. However, in 1999 these experiences are those of officer cadets; by the end of the period recruitment blogs are focused on 'other rank' training. All three armed services have had monthly magazines published by the MoD, the content of which has been made available online. However, in each instance the magazine operated on the .co.uk domain rather than the .mod.uk domain.[38] The importance, and closeness, of the magazines to their parent force is illustrated by the redirect on rafnews.co.uk which forwards users to a holding message on raf.mod.uk. The MoD also operated a blog during this period. *Defence News* is its official news blog and is designed to present a proactive image of the MoD,[39] and to attempt to refute negative press stories.[40]

Both the RAF and Royal Navy sites have focused on current operations but they have done so in different ways. The RAF hosts more written and image content on operations and has a significant section of its site focused on its current operations and commitments. The Royal Navy provides users with an overview of its global operations and the ability to identify the general global location of many of its military assets from a prominent position on its

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[35] Careers, Is the RAF for Me?, Recruit Blogs: RAF http://web.archive.org/web/20080610084951/http://www.raf.mod.uk/careers/istherafforme/recruitblogs.cfm [Internet Archive, site captured 10 June 2008].

[36] Jack Speak: Royal Navy http://web.archive.org/web/20110903094613/http://royalnavy.mod.uk/jackspeak/ [Internet Archive, site captured 3 Sep. 2011].

[37] Sandhurst Diaries: British Army http://web.archive.org/web/19991006132355/http://www.army.mod.uk/sandhurst/default.htm [Internet Archive, site captured 6 Oct. 1999]

[38] Soldier Online: Soldier Magazine http://web.archive.org/web/20030413063618/http://www.soldiermagazine.co.uk/soldier.htm [Internet Archive, site captured 13 Apr. 2003]; Homepage: Navy News http://web.archive.org/web/20120317091126/http://www.navynews.co.uk/ [Internet Archive, site captured 17 March 2012]; RAF News Online: RAF News http://web.archive.org/web/20050903104524/http://www.rafnews.co.uk/default.asp [Internet Archive, site captured 3 Sept. 2005].

[39] Defence News: MoD http://web.archive.org/web/20070820124612/http://www.blogs.mod.uk:80/ [Internet Archive, site captured 20 Aug. 2007].

[40] Defence News: MoD http://web.archive.org/web/20070820124612/http://www.blogs.mod.uk:80/ [Internet Archive, site captured 20 Aug. 2007].

homepage. The Royal Navy also hosts an operations section on its website which is given a similar position in the top navigation as the RAF's but the content of which is less expansive. The British Army website also hosted information on current operations and deployment which was similar in scale and style to that of the RAF but this was less prominent in its online content.

The RAF homepage's focus on the history of the RAF sets it apart from the other Armed Forces. Both the Royal Navy and Army have sections on their respective histories but it is not a prominent part of their online content for much of this period, although the Royal Navy increases the prominence of its history section in 2006 by introducing a link into its top navigation.[41] The RAF gave its history section a prominent position in its top navigation throughout this period as well as hosting content on its homepage.[42] The RAF website focused on the role of the RAF, its force capabilities, and its history.[43] Its recruitment page content has more similarities to the Royal Navy than the British Army. Given the technical specialism of roles in both the Royal Navy and RAF, this shared approach is understandable; it also explains why they have maintained the use of the term 'career' as the British Army has moved away from it. The RAF homepage had a prominent focus on publishing news and information throughout this period. The British Army's homepage published news and information while towards the end of this period the Royal Navy introduced a greater focus on and gave more prominence to news stories and forthcoming events on its homepage. The RAF's identity has always been one of the most prominent elements of its online content.

Visualizing the .mod.uk domain link data, extracted from the UK Web Archive 1996–2010 host level link graph, identified several areas to undertake further qualitative analysis of the link data. One of the interesting results to emerge from the link visualisation was the role of the MoD agency SaBRE, which occupied a central position in the Gephi visualization of the .mod.uk link data for 2005 (see Figure 4). SaBRE generated links from within the .mod.uk domain and a range of organizations outside it during this period. Reserve organizations are prominent among the hosts of links, as are local authorities and city councils. National and local chambers of commerce are also among the hosts of links to SaBRE and represent the most significant source of business and trade links; there is a shortage of links from companies and corporations in the data, possibly because such organizations operated primarily on the .com domain and are therefore absent from the UK Web Archive data. Figure 5 shows that the number of links to SaBRE peaked in 2004, shortly after the mobilization of reservists for Operation Telic – the invasion of Iraq – and the TA contributing to the forces in Afghanistan. However, suggesting a connection between the link data and

[41] History: Royal Navy http://web.archive.org/web/20090402053654/http://www.royalnavy.mod.uk/history/ [Internet Archive, site captured 2 Apr. 2009].
[42] Homepage: RAF http://web.archive.org/web/20121010161014/http://raf.mod.uk/ [Internet Archive, site captured 10 Oct. 2012].
[43] Homepage: RAF http://web.archive.org/web/20070811184231/http://www.raf.mod.uk/ [Internet Archive, site captured11 Aug. 2007].

these events is problematic. SaBRE itself was only formed in 2002: some of the instances of links in 2004 could be the result of websites not being archived in the intervening period.
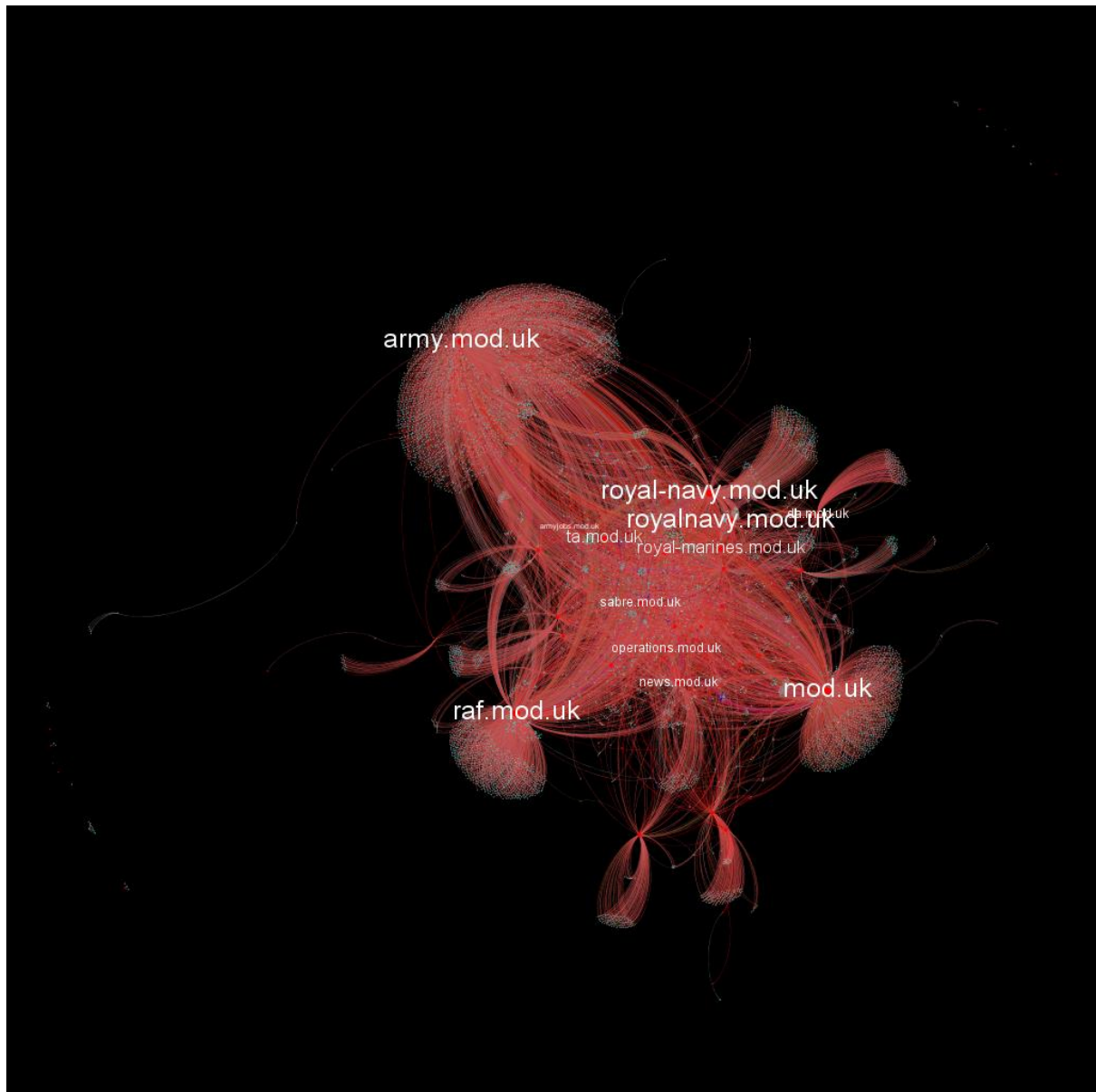

Figure 4 – Gephi visualisation of the .mod.uk link data (2005).
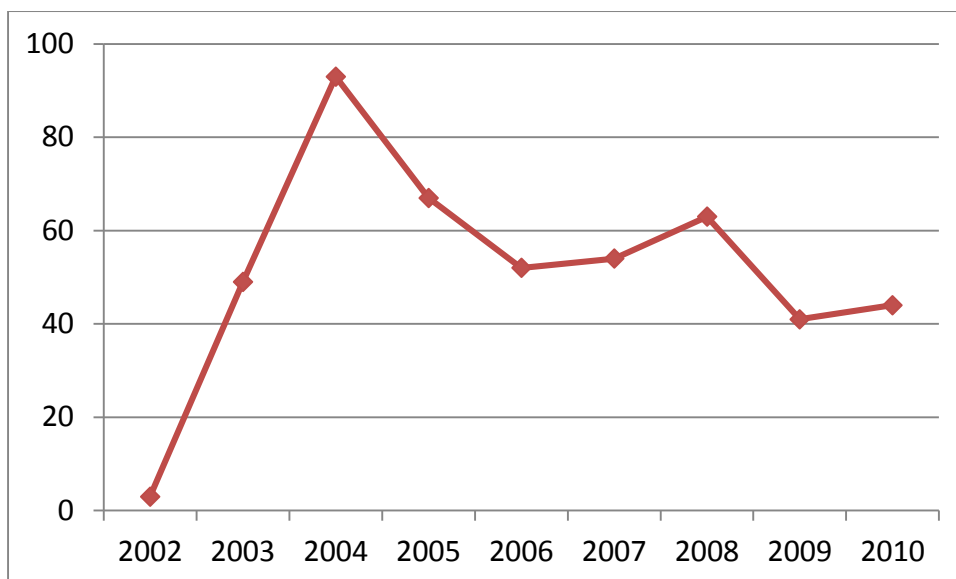
Figure 5 – Instances of external links to sabre.mod.uk.

In studying MoD link data an anomaly became apparent among the links originating from the .ac.uk domain. As can be seen in Figure 6, a web address for the Defence Academy, da.mod.uk, reported an extraordinarily high number of links in 2008: 14,895 instances of links from .ac.uk hosts to da.mod.uk occurred in the UK Web Archive data, representing 85 per cent of links from .ac.uk hosts to the .mod.uk domain. In 2006 the da.mod.uk address and an alternate address for the defence academy, defenceacademy.mod.uk, were linked to at an above-average level but not to the extremes of 2008.

The high link frequency for the Defence Academy in 2006 and 2008 was, in each instance, the result of a single website. In 2006 the host diglib.shrivenham.cranfield.ac.uk records 4,353 instances of links within the data. In 2008 14,816 instances of links to the Defence Academy came from defac.ac.uk. In 2006 the links originate from the academic provider and partner of the Defence Academy, while the 2008 host is the Defence Academy operating from a further alternative web address. The anomaly in the link data revealed the vacillation of the Defence Academy in choosing which domain to operate on. Using the UK Web Archive, it is possible to identify that in 2008 defac.ac.uk was a secondary URL address for the Defence Academy. Rather than posting an HTTP 302, the defac.ac.uk page hosted an iteration of the Defence Academy webpage where all links run through to the Defence Academy's da.mod.uk webpage.[44] Documents within the UK Web Archive show that the Defence Academy has alternated between using defac.ac.uk and da.mod.uk as its official URL for publication purposes. The first iteration of defac.ac.uk available in the UK Web Archive is in 2006, at which point a study of the defac.ac.uk and da.mod.uk sites reveals the defac.ac.uk address to be the primary web address; in 2006 the da.mod.uk site housed a copy of the homepage but the top navigation and links were aimed at the defac.ac.uk site.

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[44] Homepage: Defence Academy http://web.archive.org/web/20080210090547/http://www.defac.ac.uk/ [Internet Archive, site captured 10 Feb. 2008].

The reason behind the scale of the Defence Academy link data anomaly is unclear; there are other instances of hosts within the data appearing to have a high frequency of links, the accuracy of which is cast into doubt following qualitative analysis of the host.
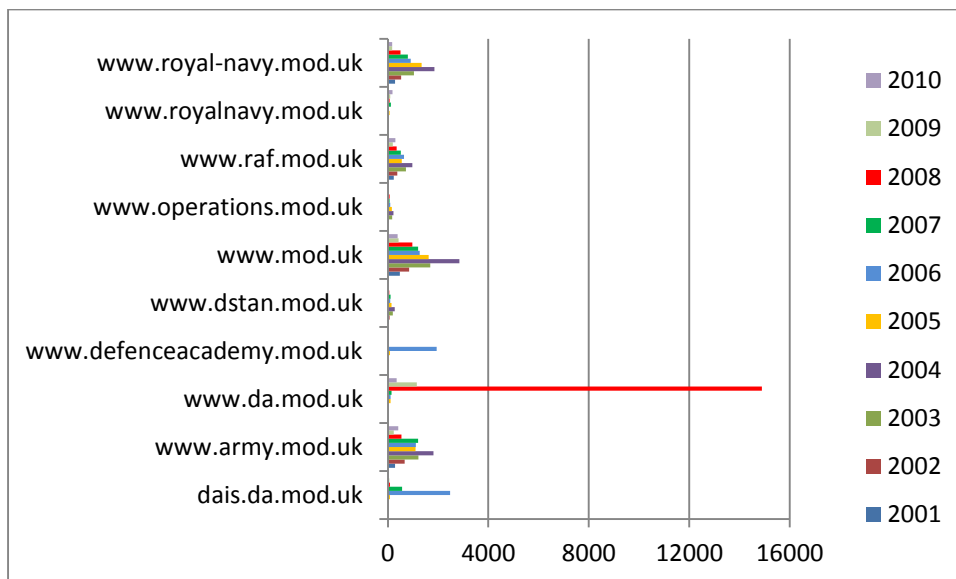

Figure 6 – Top ten target of links from .ac.uk sources.

The MoD link data was also used to explore the interconnectivity of Welbeck College, the Defence Sixth Form College (DSFC), within the online MoD network. This was an area identified as in need of study after qualitative analysis of the army.mod.uk site was completed in the initial corpus of websites. For the army.mod.uk site the prominence of the army's educational establishments seemed to vary during the period, becoming minimal at particular points and increasing in prominence at others.[45] However, targeted searches for information within the UK Web Archive resulted in a number of returns: 5,964 on the .mod.uk domain and 978 on the army.mod.uk website. These are countered by returns for the Army Foundation College (AFC) and the Army Technical Foundation College (ATFC) of 22,279 and 1,029, on the .mod.uk domain, and 8,027 and 534, on the army.mod.uk website, respectively (see Figure 7). This is an area which has been controversial for the British Army and it was criticized in 2008 for operating a closed system where the proportion of scholarships to Welbeck College which were awarded to youngsters from private schools stood at three-quarters.[46] Link analysis identified that Welbeck College was effectively connected to the parts of the MoD network that corresponded to its purpose. However,

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[45] Army Jobs, Further Education: British Army
http://web.archive.org/web/20031124055332/http://www.army.mod.uk/careers/further_education/index.ht
ml [Internet Archive, site captured 24 Nov. 2003]; Training and Education: British Army
http://web.archive.org/web/20130704033038/http://www.army.mod.uk/training_education/education/defa
ult.aspx [Internet Archive, site captured 4 July 2013].

[46] House of Commons Defence Committee, *Recruiting and Retaining Armed Forces Personnel*, Fourteenth
Report of Session 2007–8, HC424, 30 July 2008.

while the overall connectivity of Welbeck increased during this period, the reverse happened for the connectivity between the British Army and Welbeck College, although links to Welbeck College as the DSFC increase. This fitted the pattern observed across the UK Web Archive, both in initial analysis of the British Army website and in the collection of data subsequently. The character of the content changes at the same time as these decreased connections, becoming less assiduous in presenting Welbeck College.[47] Contrasting the link data for Welbeck College with the British Army's other educational establishments is difficult because the AFC and ATFC online content has primarily been hosted on the British Army website. In the case of the AFC one can identify an AFC.ac.uk website, and the frequency of links to this site from the army.mod.uk website are of a similar order to those of Welbeck College for the period in which they occur; however, this is only over three years.
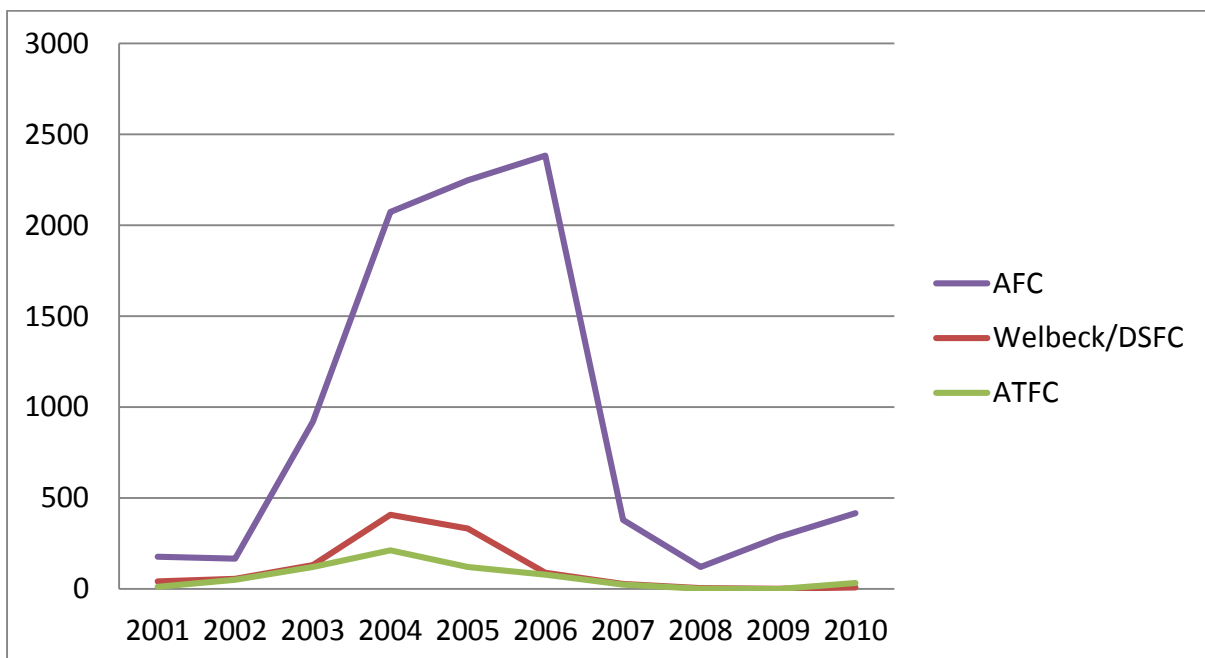

Figure 7 – UK Web Archive results for individual educational establishments on army.mod.uk.

It had been hoped to use Gource to undertake a temporal visualization and analysis of the link data (see Figure 8). The Gource visualization of the TA website link data revealed that it would be of limited value, for the reasons already discussed. However, within the hosts targeting the TA website there were higher than expected returns from Signals regiments, organizations and associations, and two high returns from medical websites,

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[47] Welbeck Board Selection Process: British Army
http://web.archive.org/web/20101213044015/http://army.mod.uk/documents/general/AOSB_Welbec.pdf
[Internet Archive, site captured 13 Dec. 2010].

medschoolguide.co.uk and tamedical.co.uk. As shown in Figure 9, the TA website was the largest target of links in the .mod.uk link data from medical website hosts for the period 2003–6, before and after which TA content was on the British Army jobs website. The high number of results from the Signals seems to have occurred because these organizations possessed individual websites which were updated frequently, meaning the links were active and remained in the UK Web Archive.[48] Analysis of materials within the UK Web Archive showed that the TA had a particular focus on recruiting for the Army Medical Services (AMS (TA)) and that content for the AMS (TA) had increased in prominence after the TA established its own website, compared to its visibility on the British Army website.[49]
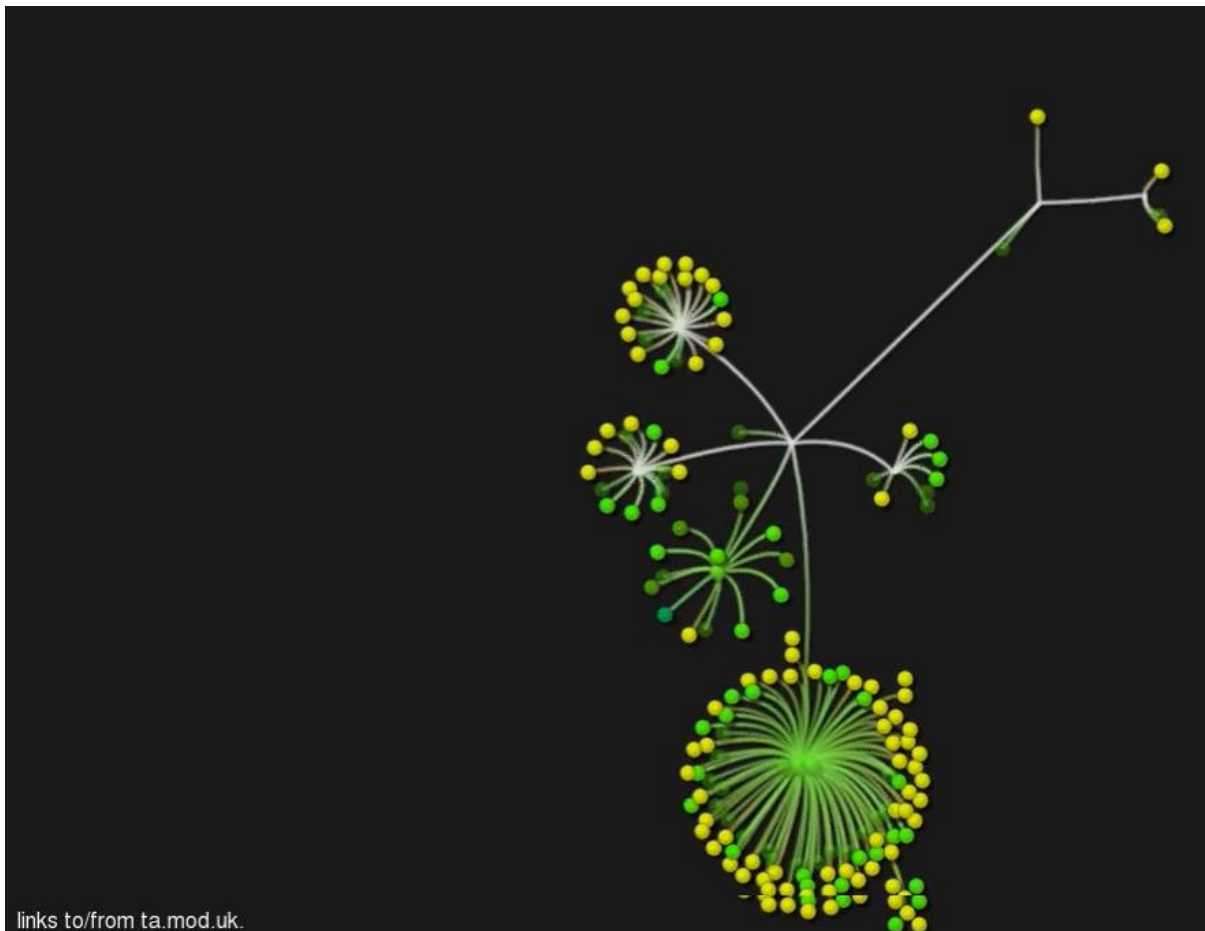

links to/from ta.mod.uk.

Figure 8 – Screenshot of the 2004–5 ta.mod.uk Gource link visualization.

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[48] Homepage: Unofficial 2nd (City of Dundee) Signal Squadron (Volunteers) Website http://web.archive.org/web/20040606200014/http://2sig.kraftysworld.co.uk/ [Internet Archive, site captured 6 June 2004]; http://web.archive.org/web/20040131151302/http://33signals.org.uk/ [Internet Archive, site captured 31 Jan. 2004].
[49] Homepage: TA http://web.archive.org/web/20040914082136/http://www.ta.mod.uk/ [Internet Archive, site captured 14 Sept. 2004].
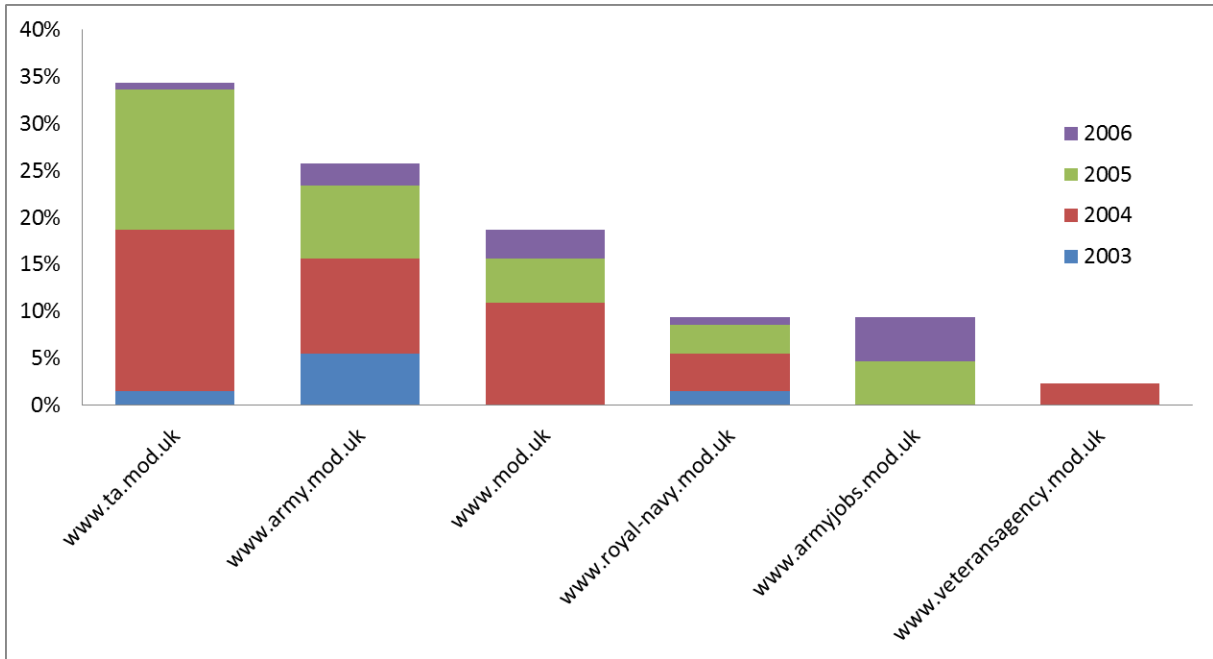
Figure 9 – Percentage of links targeting the .mod.uk domain from websites determined to be of a medical nature.

Conclusion

The content and design of the MoD's website developed significantly during this period. However, the aims underpinning the MoD website have remained unchanged; early discussion of how the MoD could utilize the internet focused on 'corporate image' and 'business and presentational needs'.[50] The MoD's websites, and the websites of its agencies, still seek to achieve these aims. Results from the UK Web Archive showed that the MoD retained a strong focus on business throughout this period. While business- specific content became less prominent on the MoD homepage as the period progressed, the MoD continued providing support for the defence industry through alternative websites. MoD agencies have committed further online resources to the promotion and support of the British defence industry; this development was shaped by the freedom of these agencies to conduct their business in the most commercially effective manner and to maximize their non-MoD profits. The MoD has focused on the provision of advice and guidance to business in order to support the diversification of the defence supply chain. However, the MoD ministerial website has remained a medium for the publication of information on the MoD and the projection of its image.[51]

Recruitment has been a concern for the online presence of the Armed Forces and they have developed their online content to integrate it with their marketing campaigns and match the interests and expectations of their target audience. However, the British Army's recruitment strategy has driven its overall online development to a greater extent than the other Armed Forces. The terminology used on the MoD site changed as part of the redesign of the British Army webpage in 2008, at the end of a period of campaigns designed to drive users online to view video content and shortly before the launch of the 'Start Thinking Soldier' recruitment campaign in 2009. A crucial part of the 'Start Thinking Soldier' campaign was the integration of web content. TV commercials showed an army mission which could then be 'continued' online and involved interactive gameplay.[52] The results of these missions could be posted on social media; links to further recruitment information were always available but other navigational links were removed from these sections (see Figure 10), in much the same way as navigation is removed from commercial sites at the checkout

[50] OMD/AD (Information) to DGICS *et al.*, 8 July 1996, annex 'Existing use of the internet' https://www.whatdotheyknow.com/request/229360/response/603132/attach/3/8%20July%201996.pdf [accessed 20 Jan. 2015]; DOMD to PS/Min (AF) *et al.*, 13 June 1996, 'MoD use of the internet' https://www.whatdotheyknow.com/request/229360/response/603132/attach/html/4/13%20June%201996.pdf.html [accessed 20 Jan. 2015].

[51] OMD/AD (information) to AUS (Pol) *et al.*, 'Internet submission to 2nd PUS', 17 Dec. 1996 https://www.whatdotheyknow.com/request/229360/response/603132/attach/html/5/17%20December%201996.pdf.html [accessed 20 Jan. 2015].

[52] SA80 A2 Rifle Range Mission, Start Thinking Soldier: British Army http://web.archive.org/web/20110811201610/http://www.army.mod.uk/startthinkingsoldier/mission/1/range-training-sa80-rifle [Internet Archive, site captured 11 Aug. 2011].

phase to drive users to complete a desired action.[53] The change in language from the more formal 'career' to the more informal 'join' was part of integrating all resources to fit the chosen audience for the recruitment strategy; the RAF and Royal Navy have maintained the use of 'career' because their recruitment requires candidates with higher technical skills. The recruitment sections for both the Royal Navy and RAF are more specific and targeted than the British Army recruitment section. Roles which are within the respective force's shortfall categories are featured prominently in their recruitment section, to a greater extent than the British Army typically accomplishes during this period. The Armed Forces have all increasingly integrated multimedia components into the recruitment sections. In the case of the British Army and RAF the online multimedia content is particularly targeted towards recruitment. The Armed Forces have also utilized blogs and social media, both of which were used to promote recruitment and encourage a positive perception of the Armed Forces' operations.

The changing location of the Armed Forces blogs discussed above was identified as a conscious decision, which seems to have been to serve two purposes. Relocating the military blogs from the .mod.uk domain had the effect that the content seemed less like an artificial position to promote the Armed Forces and instead seemed more genuine. However, the main benefit behind relocation was that it lowered the administrative burden of using blogs; blogs became easier to update and required a lower degree of formal approval for content as they could less easily be confused for official statements or positions. The Armed Forces have progressively come to appreciate the value of social media as potential recruits spend more time online. Unfortunately a great deal of the Armed Forces content for social media is unavailable through the UK Web Archive. However, where social media content is present it is highly geared towards recruitment, with content aimed at interactions rather than simply posting information. The pages of the British Army website have been tied in to its social media presence in order to encourage users to interact. However, these elements are not new in concept. Throughout this period the British Army has sought to provide users with a transformative online experience, with the ability to live chat online with the Army careers team. Similarly much of the content which is now available online on the Armed Forces social media websites was originally available directly through their websites. The change has been in how effectively the Armed Forces have integrated their online presence and the sophistication with which they have done so.

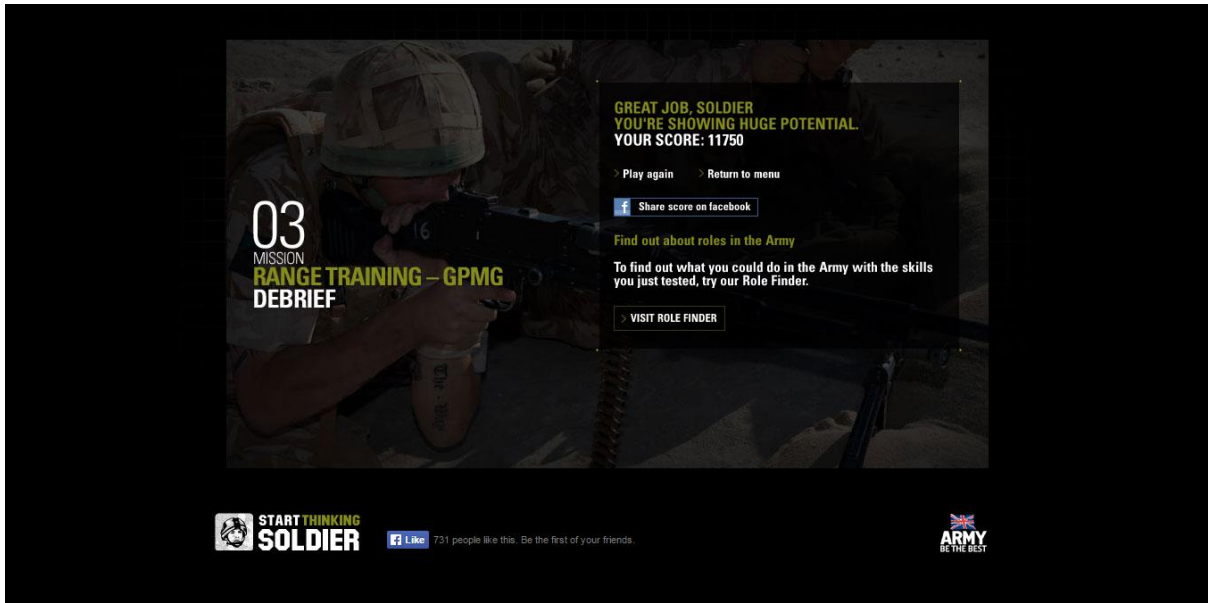[53] G. Colborne, *Simple and Usable Web, Mobile and Interaction Design* (Berkeley, Calif., 2011)*,* pp. 94–5.

Figure 10 – 'Start Thinking Solder' results screen from GPMG range training.

The reduction of links to the recruitment section observed on the British Army website during this period does not appear to be the result of recruitment being deprioritized. The online content of the British Army site was redesigned to eliminate duplicate links and to achieve an increase in the click-through rate of those links which remained. This change corresponds to the development in web design which stressed that 'removing options, content, and distractions lightens the load on the user so they can focus on getting the job done. Removing visual distractions help them process what they're seeing faster and more reliably'.[54] Confirmation that this was the cause of the link deduplication on the British Army website came through thematically coding and visualizing the homepage.

The 2008 redesign of the British Army website lowered the prominence of recruitment in the homepage content and top navigation; however, a reduction in the importance of recruitment was not behind this development. In 1996 users were likely to begin their journey through a site from the homepage. By 2008 the efficiency of search engines resulted in users being more likely to enter a sublevel page of a website than the homepage.[55] Deep-linking also resulted in users navigating to specific sections of the site as opposed to the homepage; interactive emails were designed to drive traffic to the British Army website with email links pointing to the recruitment section.[56] This trend in internet use was reflected in the navigational layout and content of the homepage. However, subsequent changes on the British Army website to increase prominence on the homepage suggest that these changes did have a negative impact, possibly leading to an increased exit rate from the homepage or an increased bounce rate for users who entered the site via the

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[54] *Ibid.*, p. 84.

[55] J. Nielson, Reduce Bounce Rates: Nielsen Norman Group http://www.nngroup.com/articles/reduce-bounce-rates/ [accessed 21 Jan. 2015].

[56] Krug, *Don't Make Me Think*, p. 92.

homepage. Further research will include a study of the recruitment pages to analyse if their content was changed to maximize search results. In this context the change in terminology from 'career' to 'joining' might reflect a trend in user searches.

One of the interesting results to emerge from the link visualization was the central position of SaBRE. Link analysis, and subsequent content analysis of the SaBRE website, showed that SaBRE successfully created content on its website that external sites wanted to link to. In particular we see a spike shortly after reservists had been deployed outside the country to supplement regular forces in Iraq. This is despite SaBRE operating from 2002 to 2008 without a major site redesign, and without having the resources to do extensive work on sabre.mod.uk. The hosts linking to SaBRE – reserve associations, local authorities and chambers of commerce – suggest that SaBRE was, to a large extent, achieving at least part of its remit as an organization that aims to build support for members of the Reserve Forces from employers. The use of link visualization helped to show areas of the .mod.uk domain where developments appeared to be occurring which could be then studied in greater depth. However, in visualizing a large body of data smaller trends can be missed. The anomalies in .ac.uk results were apparent in the Gephi visualization but the cause of this could only be found through further research in the .mod.uk link data and the UK Web Archive.

Link analysis was also of limited value in understanding the online development of the British Army from the perspective of its educational establishments. While Welbeck College possessed a website which was linked to by the British Army website for much of this period, either as Welbeck.ac.uk, Welbeck.mod.uk or dsfc.ac.uk, the AFC was only linked to by the British Army website between 2004 and 2006 and the ATFC does not appear to have had an online presence beyond the British Army website. There is also no way of interpreting the link data to see how prominently these sites were being linked to and how this developed. The link analysis of the British Army educational establishments was therefore a rather fruitless experience.

The experience of using Gource as a visualization technique did not reveal a great deal beyond what was already apparent through the link data. However, the smaller trend of Signals and Medical websites linking to the ta.mod.uk website emerged as a result of the reduced TA link dataset produced for the Gource visualisation. The high results from websites associated with the Signals showed that the Signals regiments were enthusiastic adopters of online capabilities, frequently updated their sites and incorporated numerous links to the TA. The results in the TA link data from medical organizations were interesting when studied in depth. In the larger .mod.uk link data more websites determined to be of a medical nature linked to the TA website than any other website in the .mod.uk domain. Inferring meaning from the link data is difficult but it suggests that the TA's efforts to provide visible content on the AMS (TA) were successful.

The findings recorded across the .mod.uk domain demonstrated that the online development of the MoD and the Armed Forces was shaped by a variety of factors. The MoD website's most significant development came as a result of changing to the .gov.uk domain. However, its initial objective for its website, to be 'exploited as a tool for placing information in the public domain and for enhancing the public perception of Defence' remained as true in 2013 as when the MoD website first went live. In the case of the Armed Forces, recruitment has been an important component of their online presence throughout this period. The online development of the Armed Forces has been driven by changes in the internet itself, both in the audience it can reach and in its capabilities. By 2013 sites were larger and far more dynamic than they were in 1996, and hosting videos and interactive elements online had become unremarkable. In 2013 36 million people accessed the internet every day in Britain and these users have grown increasingly sophisticated in how they use the internet to find information.[57] In 2000 the majority of users of .mod.uk websites sat at a desk with a large screen, a mouse and keyboard. Now users can just as easily be walking past an Army Reserve barracks looking up details on a mobile phone or tablet.[58] These changes forced websites to evolve and the Armed Forces, and the MoD, were quick to adapt their online presence to the developments that emerged throughout the period.

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[57] Key Points, Internet Access – Households and Individuals, 2013: Office for National Statistics http://www.ons.gov.uk/ons/rel/rdit2/internet-access---households-and-individuals/2013/stb-ia-2013.html [accessed 21 Jan. 2015].

[58] Krug, *Don't Make Me Think*, p. IX.